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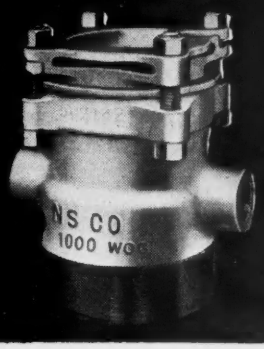

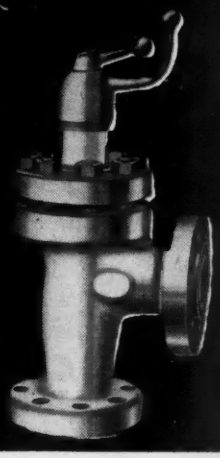

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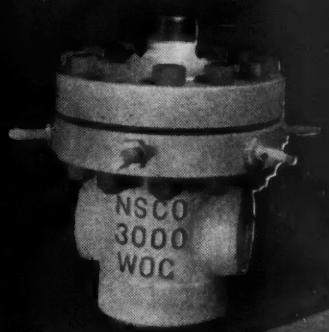

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Looking Ahead

WITH THE EDITOR

GREAT strides have been made in the design of electrical equipment for oil field application since the early 1930's, when the use of electrical motors for pumping wells began to gain importance. Because of the availability of electrical power in many oil fields and the ease with which it may be transmitted, operators have frequently utilized this method of pumping. Much progress has been made in the application of electrical equipment as it pertains to the producing industry, and for this reason the efficiency of oil production by this method has proven exceptional in many areas.

The particular adaptation of electrical equipment to pumping oil wells and the efficient design of such systems involves engineering problems different from other methods. Little has been written on the manner or approach to such design and installation problems. One of the most important is that of proper power distribution. For it is through the effective design of power distribution systems used in the pumping of oil wells in any field that economies may be effected. This phase of the problem is the most flexible and justifies the careful analysis of the design engineer.

As an aid to the producing industry in designing efficient power distribution systems, THE OIL WEEKLY will present next week "Power Distribution Systems for Oil Field Pumping Service," by W. C. Bloomquist, application engineer, Industrial Power Division, General Electric Company, Schenectady, N. Y., and J. N. Poore, petroleum application engineer, Dallas office, General Electric Company. This is the first of a series of three articles in which a careful review has been made of the pertinent factors associated with power distribution systems for oil field electrification. Engineering and cost data will be included.

THE OIL WEEKLY, published every Monday. Entered as second class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

Specialized Oil Publications of
THE GULF PUBLISHING COMPANY
Box 2608, Houston (1), Texas

The OIL WEEKLY and The COMPOSITE CATALOG
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PETROLEUM REFINER and The REFINERY CATALOG
for the refining-natural gasoline industry

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Published every Monday. Single copies 25 cents (except special issues). Subscription price: domestic and foreign, $2 a year; 2 years, $3; 3 years, $4. Advertising rates on application. Copyright 1946 by The Gulf Publishing Company.

The OIL WEEKLY

ENGINEERING NEWS STATISTICS

R. L. DUDLEY, President, Publisher A. L. BURNS, General Manager

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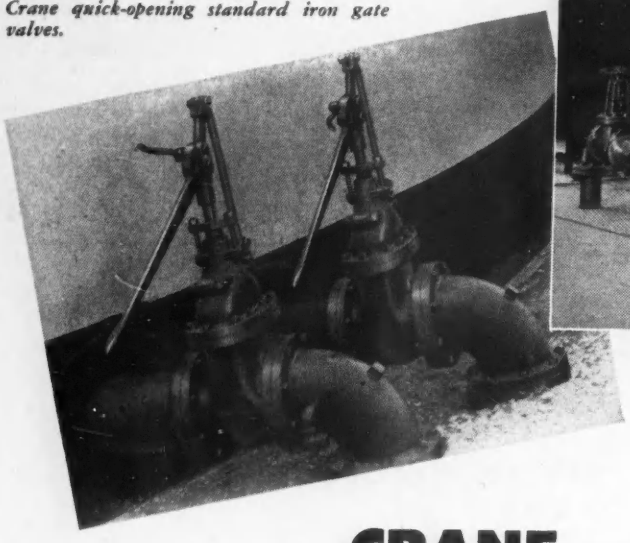

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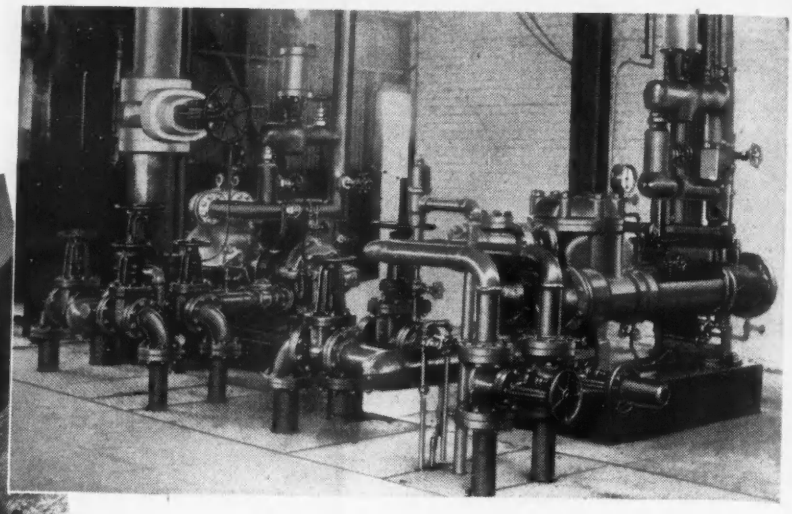

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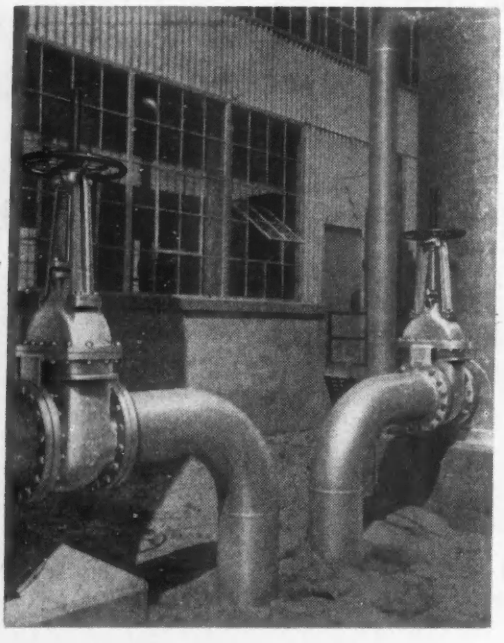

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THE CHANGING Panorama

Pipe Lines Change A Nation's Economy

THE trend toward wider use of petroleum throughout the United States is attested in no way better than by the current spurt of pipe line construction. Some 15,000 miles of new lines for transport of oil and gas are being planned and during the next two years much of it will be laid.

These lines and others which will be projected from time to time, will serve as arteries in the distribution of petroleum and natural gas, a distribution that is expanding daily at the expense of the strike-ridden coal industry.

The coal industry is losing out in two ways. It suffers from increased competition of natural gas and fuel oil as both become available in markets heretofore exclusively coal's. And to a lesser extent, it is suffering because fewer and fewer coal-burning locomotives are called upon to move oil tank cars.

New lines are stretching across many states as the modern efficient network expands, some of them being designed to span considerable distances. For instance, one company recently announced a crude line from Texas to Illinois. And products carriers are projected from Whiting, Ind., to Moorhead, Minn., and from Barnsdall, Okla., to South Dakota. A new gas line will carry Texas gas to the Pacific Coast and another one, just approved by FPC, runs from Texas to the states of Michigan and Wisconsin. These are but samples. Thousands of miles of smaller lines also are being built or existing lines are being looped.

Many industries will feel the impact of this new construction. The steel mills get a market, as do manufacturers of pumps, electric motors and diesel engines.

One pressing motive, of course, for this activity is the matter of trimming oil transportation costs. Last year Class I roads hauled more than 10 million tons of crude oil and 51 million tons of refined products—amounting to 4.4 percent of their total freight. Revenue from this was $456 million. Pipe liners point out that increasing railroad rates will boost this take. And, of course, increasing oil markets. Petroleum markets are on the increase, too. For instance, the nation's gasoline market in 1940 was 589 million barrels while this year it will approach 700 million.

The economy of the nation doubtless is undergoing a change by reason of this rapid expansion of petroleum and gas pipe line facilities. Utilization of the Big Inch and the Little Big Inch lines to carry fuel into strike-bound areas is but a sample of what can happen, but on a much larger scale, when this network is given a few years in which to develop and serve a nation's people.

J. Edgar Pew

FEW men have left the imprint on their industry that J. Edgar Pew of Sun Oil Company left. His was a personality of friendliness; yet at the same time he was known as a man who accomplished what he set out to do.

His work in connection with the standardization program of the American Petroleum Institute formed a most important contribution to the success of that effort.

In the days when he represented his company in Texas he was recognized as one of the most important links between the independent and the integrated industries.

And with all of it, his keen sense of humor, his great vitality, his sturdy adherence to the sound principles which guided his life made him beloved by those who knew him.

The oil industry has lost within the recent past several stalwarts—men who were pioneers in the industry, men whose influence will be lasting. Prominent among them in the history of the petroleum industry will be the name of J. Edgar Pew.

Colombian Unions A Political Stick

UNIONISM has become a partisan political instrument in Colombia and the oil companies find themselves in the ticklish spot of being used in conflicts they'd rather avoid. The oil industry strike there has been settled but not the political atmosphere.

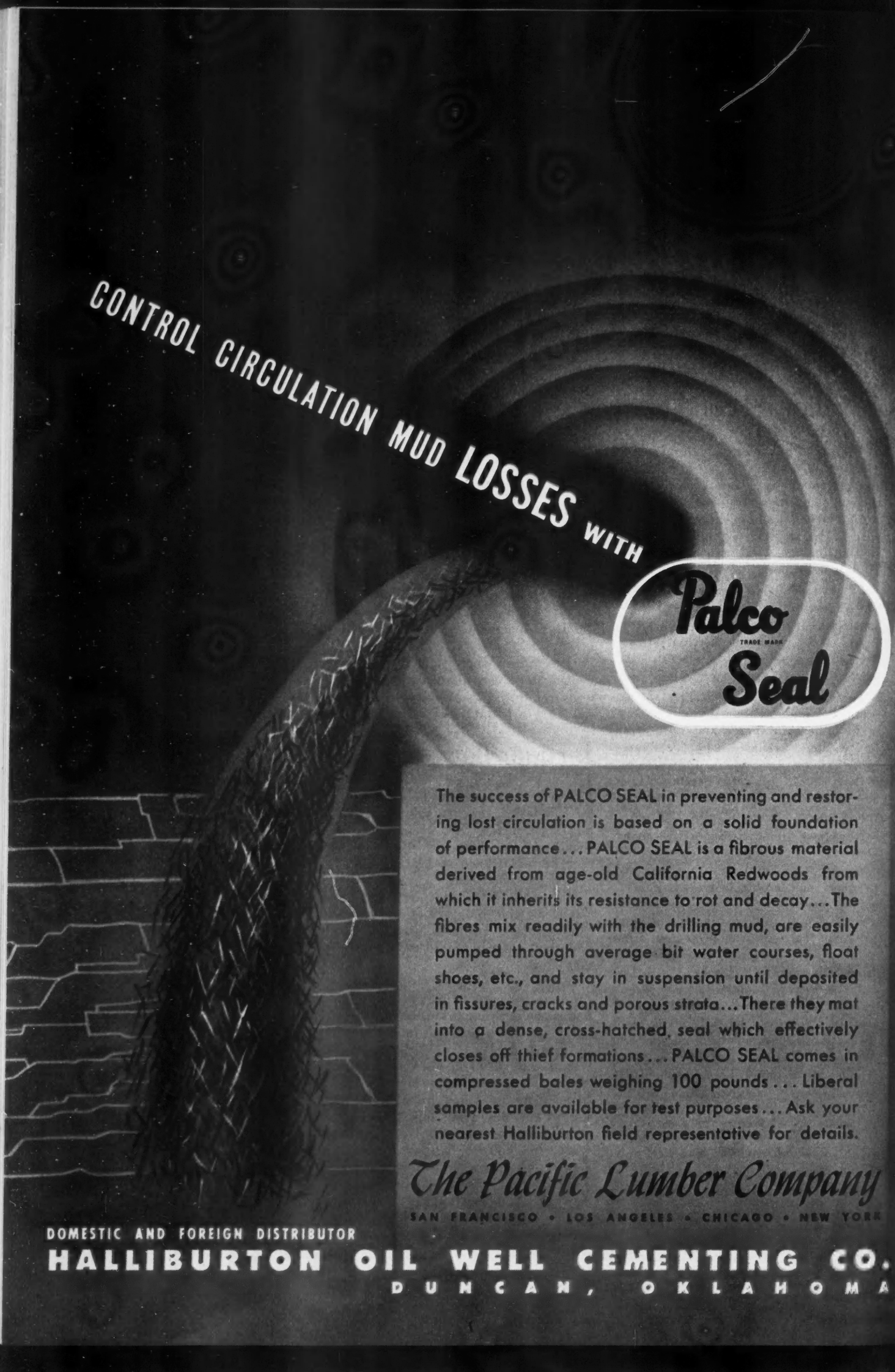
Experienced oil operators are convinced that stoppage of work was not caused by any valid objections of labor itself to its existing contract. However, increasing cost of living was set up as the main grievance and the companies, each of whom settled by separate negotiation, granted certain concessions, principally wage increases.

During the time the workers were out, additional pressure was brought on the incumbent Conservative government by resignation of five Liberal cabinet members and other officials throughout the provinces. The President was in the position of heading a Conservative government which had been a coalition cabinet and a largely Liberal Congress. The Conservative cabinet members then resigned to leave the President free to name a new cabinet. Meanwhile, the cabinet has yielded to the President's pleas to serve in the interim. There is an apparent tendency on the part of some top Liberals to collaborate with the government, but this is by no means unanimous and the situation remains tense, particularly with an overwhelmingly Liberal Congress likely after the forthcoming election.

Labor unions recently have been revealed as a powerful weapon said to be largely at the disposal of the Liberal party. The unions can be used at any time to discredit the administration and likely will be. Employer oil companies, meanwhile, are being taken for a ride when the political bosses say so.

* * *

Physicists reveal that the cost of making an atomic bomb is now only $1 million. At that the world can't afford 'em.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THE WEEK'S NEWS

CRUDE oil production in the United States of 1746 million barrels in 1947, an increase of 15.1 million barrels over 1946, has been forecast by the Bureau of Mines. Imports were placed at 89 million barrels against 87.2 million barrels in 1946. Page 27.

Europe Unsettled—Unsettled political and economic conditions in Europe indicate little likelihood that the way will reopen in the near future for the return of private oil operations in France or Spain, John Loftus reports. Page 24.

Interior's Oil Views—Interior Department recommendations for national oil policy were emphasized as the special petroleum committees of the Senate and House neared the deadline for the filing of final reports on their investigations. Page 28.

Big Inch Recommendation—Sell to the "highest and best bidder, preferably for cash," regardless of whether they are to be used for oil rather than gas, or for both is the recommendation of four members of the House Surplus Property Committee regarding the disposal of the Big and Little Big Inch pipe lines. Story below.

Trade Agreement Deadline—Deadline for the filing of briefs in opposition to further cuts in petroleum import excise taxes in the making of new reciprocal trade agreements has been set as December 21. State Department may issue a supplemental list of commodities to be traded.

Ball Succeeds Davies—Max W. Ball is taking over direction of the Oil and Gas Division of the Department of Interior, succeeding Ralph K. Davies who is retiring from government service. Page 24.

Congress Postponed—The First South American Petroleum Congress, originally scheduled for Lima early in March, has been postponed until June. Page 28.

Mother Hubbard Prospects—The Department of Justice will reveal its intentions with respect to the Mother Hubbard suit today, with probability that case may be withdrawn in favor of separate suits against individual defendants. Page 28.

Saudia Arabian Deal—Standard Oil Company (New Jersey) is reported dickering for an interest in Arabian American Oil Company with its immense reserves. Page 29.

Rubber Control—Termination of the Second War Powers Act when it expires next March, but continuance for a year thereafter of priority and allocation controls on rubber is recommended by a House committee.

Boyd's Annual Statement—The American petroleum industry produced the greatest amount of crude oil in its 87-year history during 1946, with ample reserves to meet all demands for liquid fuels and lubricants in the foreseeable future, William R. Boyd, Jr., president of the American Petroleum Institute, said in his annual year-end review.

Lease Bidders to Get Early Return of Deposit

The Interior Department last week met another of the major recommendations made by industry representatives at the Denver hearing in September on public land leasing regulations, announcing that a new procedure had been adopted under which deposits made in connection with bids for leases on the public lands will be returned immediately to unsuccessful bidders.

Heretofore the required deposit of 20 percent has been held up by administrative practices in the department which resulted in tying up considerable sums of capital for an indefinite period.

Hereafter, Secretary Krug announced, such deposits will be returned at the end of the same day on which bids are opened, and in addition, notice will be given immediately to the successful high bidder of his right to a lease, subject to his qualifying, etc.

Agenda Group Meets

Less than half the members of the Agenda Committee of the National Petroleum Council were present at the meeting last week at which the program for the council's next meeting, January 21, was discussed.

The committee had before it three of the recommendations made by OGD Director Ralph K. Davies for council consideration, the development of statistics, national oil policy and aviation fuel for military use. It was decided to report decisions reached on these subjects to the members who did not attend, with a request that they mail or telegraph their views.

Sell Big Inch Lines to Highest and Best Bidder, House Group Suggests

Four members of the House Surplus Property Committee today recommended that the Big and Little Big Inch pipe lines be sold to the "highest and best bidder, preferably for cash," regardless of whether they are to be used for oil rather than gas, or for both, with one member, Representative John J. Rooney of New York, opposing the use of the lines for gas as tending to perpetuate a monopoly in the petroleum industry.

The committee, critical of the confusion and delay which have attended the effort to dispose of the lines, pointed out that, despite the known need for additional natural gas in the Appalachian area and the efforts of several companies to get temporary leases, no action to that end was taken until the hearings had produced testimony to the effect that such use was practical.

The investigation, the report stated, disclosed that despite the fact that committees representing the major oil companies and the small independent operators, respectively, had recommended to the Senate Surplus Property sub-committee that the lines not be used for oil, and despite the report of Ford, Bacon and Davis, which cost the RFC approximately $50,000 to the same effect, the Symington report of January 4, last, "completely ignored" the views of the industry and competent engineers and made "an almost unqualified" recommendation for oil use. Later, Symington confessed he had relied upon the advice, opinions and conclusions of assistants, was not familiar with the recommendations of the industry and had never heard of the Ford, Bacon and Davis report when he signed his report to Congress.

The principal author of the Symington report, the committee said, is a young man who "has had absolutely no experience in the world of business or transportation and, in particular, none in the oil and gas industry."

As an example of the confusion in the handling of the lines, the committee pointed out that when they were advertised for sale they were offered for use as carriers of either oil or gas "in spite of the fact that the present WAA administrator testified that it was his opinion, and the opinion of his counsel, that he could not dispose of the lines for the transportation of natural gas without resubmitting the matter to Congress and re-advertising the lines for sale."

The vagueness and uncertainty of these advertisements was demonstrated by the fact that the 16 bids which were received embodied 24 proposals, the report continued, emphasizing that the four highest cash bids were for gas use and ranged from $80 million to $85 million while the best bid for oil was $66 million.

"It is not the function of this committee to make recommendations to the administrator," the report said. "The delay in disposing of the pipe lines has been caused by a variety of reasons, including delays in advertising, checking bids, etc., but in particular it is now

being delayed by the so-called Symington report.

"Speed in disposition of the lines is essential to save the government the accelerating depreciation, now conservatively estimated as $10,000 to $12,000 a day and the maintenance cost of $60,000 a month.

Better Deal for Gas

"The committee is of the opinion that, from the preponderance of all the credible evidence, it is probable that a better dollar sale can be arranged for the use in gas transmission rather than for the carrying of oil," the report concluded.

"In addition to the industry reports above referred to, as well as the Ford, Bacon and Davis recommendations, the committee feels that the evidence heard from witnesses in the instant hearing is heavily weighted in favor of gas utilization.

"It is the conclusion of this committee that the lines should be sold to the highest and best bidder, preferably for cash, whomever he may be, regardless of whether such bidder desires to use the lines for the transmission of oil rather than gas, or for both. It is the conclusion of the committee that the best results so far as bids are concerned will be obtained by proposals of sales with as few strings tied thereto as possible. Any other course in the opinion of the committee might well lead to the stalemate that has so long contributed to the costly delay now prevailing."

The committee recommended that in considering bids the WAA should give consideration to the possibilities of saving the billion or more cubic feet daily of natural gas now being wasted in Texas.

It held that the questions of FPC certificate and right-of-way in Pennsylvania are matters of concern to the bidders and not the WAA, and suggested that the necessary clause be inserted in any sale contract to permit recapture of the lines in the event of another emergency and that, before acceptance, the contract be referred to the Attorney General for an opinion of its conformity to the anti-trust statutes, as required by the Surplus Property Act.

Curtailment of FPC Power Favored by Mid-Continent

Drastic curtailment of regulatory functions exercised by the Federal Power Commission over the natural gas industry were recommended by the Kansas-Oklahoma division of the Mid-Continent Oil & Gas Association at the annual meeting held in Tulsa.

A resolution recommended that the Natural Gas Act be amended so as to expressly deny to the FPC any authority to regulate 1) directly or indirectly the production and gathering of natural gas, 2) the sale—including the price—of natural gas sold by the producer or gatherer, and 3) the end-use of natural gas.

Officers were re-elected as follows: F. M. Porter, Fain-Porter Drilling Company, Oklahoma City, president; L. G. Owen, Tulsa attorney, first vice president; and Clarel B. Mapes, secretary treasurer.

European Conditions Unsettled, Oil Company Problems Described by Loftus

Political and economic conditions on the continent are so unsettled that decisions by oil companies operating in that are are difficult and in many instances impossible, John A. Loftus, chief of the State Department petroleum division has reported upon his return from Europe.

Loftus cited as an example the situation in France, where the "GAC," a group of oil companies formed by the government to handle marketing, could not overcome its difficulties and is calling upon companies to undertake expansion involving millions of dollars. It would double the prewar supply of petroleum.

France's Problems

The companies, he said, are unwilling to do this so long as the GAC is in control and there is considerable doubt whether they would do it even if the group were dissolved, a move they are working for. Major problems, Loftus said, are a shortage of tankers, a lack of dollar exchange and inability of the GAC even to purchase some of the products it wants.

The situation would not necessarily be clarified by return of oil business to private hands, Loftus explained, because the government has not yet adopted a clear-cut policy on industry and if a "left" administration came into power, it might raise the question of nationalization.

The picture with respect to Spain also is confused, he said, and discussions in London with informed people indicated that the Spanish government itself doesn't know what to do about oil. The state monopoly expires next year and there has been some thought that arrangements which would benefit American oil companies in that market might be worked out.

British Information

Mutual reassurances were expressed, Loftus said, that both governments are hopeful that the Anglo-American petroleum agreement would be made effective, but there appeared little confidence in any quarter that Russia would participate in any plan for a world agreement. Russia's position on international trade agreements was made clear by her abstention from participation in the preliminary conference in London on the elimination of artificial barriers to international trade.

British officials explained their policy in recent troubles in Iran, pointing out that they had moved to insure the safety of their nationals in that country, and volunteered a great deal of information regarding their future oil plans. Kuwait will be extensively developed during the next few years and by the end of a decade is slated to be one of the world's great producers. Other areas which will be important in the British set-up are Qatah and Basrah, in which American operators have a one-fourth interest.

Max Ball Assumes Duties As Director of OGD

Max W. Ball, petroleum consultant and author, is taking over the direction of the Oil and Gas Division succeeding Ralph K. Davies, who is leaving government service. The new director accepted the post only after repeated urging by Davies. Initially, the offer was declined because Ball felt he had been out of the country so long he had lost touch with the Domestic industry and also because he had an important consulting job to do for Michigan Consolidated Gas Company. With that commitment completed, however, Ball "broke into" the division he is to head by acting as a special consultant on the emergency gas use of the Big Inch pipe lines.

Ball, however, has long been familiar with government techniques having served with PAW during the latter part of the war and preparing the presentation of PAW's "report" to the O'Mahoney committee last year. He is not expected to make the OGD his permanent job, but probably will serve about a year.

Would Curb FPC

Panola County (Texas) Royalty Owners' Association by resolution recently called on Congress to restrict the Federal Power Commission's authority over production, gathering, prices and use of natural gas, with particular exhortation that FPC's control over intrastate gas be curbed.

John F. Gray, Dallas, attorney and spokesman for the royalty owners, and E. O. Thompson, member of the Texas Railroad Commission, were speakers at the meeting.

Moore to Have Important Role In the New Senate

Senator E. H. Moore of Tulsa is slated to become chairman of the Special Petroleum Investigating Committee if the life of that Senate committee is extended. He also will retain his place on the Interstate Commerce Committee, which under the reorganization bill, will merge with the old Commerce Committee into a new Interstate and Foreign Commerce Committee, with jurisdiction over oil.

School Lands Leased

Total bonus accepted was $962,589 for mineral lease awards on school lands offered at a sale held December 3 by the Texas School Land Board. The largest single offering was $47,896 by Phillips Petroleum Company for 785 acres in Nueces Bay. Major oil companies bid in most of the tracts, the majority of which were in submerged areas.

Bureau Forsees Gain of 15 Million Barrels Production in 1947 Over 1946

Crude production in the United States is expected to run to 1746 million barrels in 1947, an increase of 15.1 million barrels over this year, with 858 million barrels produced in the first half and 888 million barrels in the last six months, it is forecast by the Bureau of Mines which, however, pointed out that conditions are still so abnormal that any forecast can be only approximate and frequently revised as actual trends become apparent.

Production other than crude was placed by the bureau at 123 million barrels next year against 115.5 million barrels for 1946, and imports are figured at 89 million barrels against 87.2 million barrels together with 46 million barrels of refined oils against 48.1 million barrels.

Total demand next year is expected to amount to 2010 million barrels against 1927 million this year, an increase of 4 percent over 1946 and a gain of 26 percent compared with 1941. This demand is seen as amounting to 488 million barrels in the first quarter, 484 million in the succeeding three months and 1028 million in final half of the year.

Demand will consist of 805 million barrels of motor fuel against 773.6 million this year; 490 million barrels of residual fuel against 484.4 million; 290 million barrels of distillate fuel against 268.9 million; 101 million barrels of kerosine against 96.4 million, and 324 million barrels of other products against 303.7 million.

Exports are seen as declining from an expected 158.1 million barrels this year to 146.5 million, with foreign demand for crude remaining unchanged at 39.5 million barrels: motor fuel dropping from 46 to 36 million barrels; residual fuel increasing from 9.9 million to 10 million barrels; and distillate fuel and kerosine dropping, respectively, from 35 to 33 million barrels and 10 to 9 million barrels, while other products increase from 17.7 to 19 million barrels.

"Analysis of the stock situation," the bureau commented, "indicates that the consumption of crude oil in 1946 was possibly 1½ percent greater than required and at least covered any stock increases for both 1946 and 1947. In considering the readjustment of this stock situation in 1947, it does not seem feasible to reduce runs to so low a level in the first quarter as to require operations that might strain refinery capacity in the last half of the year, particularly if total demand should exceed present estimates. The forecast of crude runs of 4.7 million barrels daily in the first quarter of 1947 is predicted on an adjustment of product yields to produce a maximum normal seasonal increase in gasoline stocks and a maximum decrease in fuel-oil and kerosince stocks. In considering the stock situation, it should be noted that, as stocks in military custody are depleted, the stocks in company custody, as reported to the Bureau of Mines, must service a larger part of the demand."

The bureau's forecast of demand for domestic crude this month, 4,677,000 barrels daily represents a decrease of 53,000 barrels from the November forecast but an increase of 184,100 barrels over actual demand in December, 1945.

The cut is seen as occurring in seven states, with Texas output reduced from 2,090,000 to 2,050,000 barrels daily: California from 850,000 to 845,000; Oklahoma, 383,000 to 380,000; Illinois, 212,000 to 210,000; New Mexico, 99,000 to 98,000; Wyoming, 97,000 to 96,000; and Arkansas, 77,000 to 76,000 barrels.

The rates for other states, unchanged from November, are as follows: Louisiana, 382,000 barrels; Kansas, 263,000; Mississippi, 60,000; Michigan, 46,000; Pennsylvania, 35,000; Colorado, 32,000; Kentucky, 29,000; Montana, 24,000; Indiana, 19,000; New York, 13,200; West Virginia, 8400; Ohio, 7600; Nebraska, 800; other, 2000.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED Dec. 14	Dec. 7
Alabama	1,050	1,000
Arkansas	75,500	73,500
California	871,200	872,300
Colorado	38,900	39,000
Florida	215	215
Illinois	202,200	201,300
Indiana	20,400	19,500
Kansas	279,950	249,550
Kentucky	30,250	30,000
Louisiana	403,325	402,785
North Louisiana	93,000	92,600
South Louisiana	310,325	310,185
Michigan	44,550	44,500
Mississippi	82,250	81,200
Missouri	100	100
Montana	23,500	24,400
Nebraska	700	750
New Mexico	103,000	102,715
New York	13,350	13,650
Ohio	7,500	8,400
Oklahoma	370,800	371,050
Pennsylvania	35,150	35,850
Tennessee	35	35
Texas	1,996,065	2,010,450
Tex. R. R. Comm. Districts:		
Dist. 1—S. Central	18,850	18,870
Dist. 2—Lower Gulf Coast	134,775	136,550
Dist. 3—Upper Gulf Coast	422,625	428,580
Dist. 4—S. West	208,800	211,300
Dist. 5—E. Central	34,615	34,930
Dist. 6—E. Texas Field	316,000	317,145
Dist. 6—Rest of N. East	99,375	100,190
Dist. 7-B—W. Central	34,500	34,615
Dist. 7-C—West	27,700	27,960
Dist. 8—West	499,725	500,800
Dist. 9—N. Central	118,000	118,490
Dist. 10—Panhandle	81,100	81,020
West Virginia	6,200	7,500
Wyoming	105,300	105,500
Total United States	4,711,490	4,695,250

Total stocks, foreign and domestic December 7, as reported by the Bureau of Mines were 225,419,000 barrels.

Price of 7 Cents a Thousand Set for Oklahoma Gas Field

The Oklahoma Corporation Commission has established a price of 7 cents a thousand cubic feet at the well head for natural gas from the Guymon-Hugoton field in Oklahoma. The order, effective January 1, fixed the unit of measurement at 14.65 pound pressure base.

At present, in the absence of any price fixing order, rates paid for gas in the field average about 4 cents a thousand feet.

The order, based on the average of 4 cents now being paid, will mean an increase of about $325,000 a month in income for lease and royalty owners in the field.

The Commission never has previously established a fixed field-wide price for Oklahoma oil or gas, although it once set a price for carbon black in the Hugoton field.

Many Visitors Attend Dallas Nomads Gathering

The first big get-together staged by the recently-organized Dallas Chapter of Nomads was held December 13 when local members and large delegations from other chapters attended a cocktail party and buffet supper at the Adolphus Hotel.

Col. George E. B. Peddy, Houston attorney who spent several years in military government posts in Europe, spoke on "The Battle of Ideas," emphasizing the conflict between totalitarian and democratic ideologies.

To Argue Tidelands?

Former Petroleum Administrator Harold L. Ickes and his son, Robert, were admitted to practice before the Supreme Court last week, raising speculation in Washington as to whether he was preparing to take an active part in the tidelands case, possibly as attorney for one of the several groups who seek to participate as *amicus curiae* when the issue comes up for argument early next year.

Crude Price Changes

Retroactive to October 9, Standard Oil Company of California made several minor revisions in its crude price schedule, involving increases of 2 to 5 cents a barrel for the Greeley and Wasco fields. This was done by giving those fields the same schedule as Coles Levee and Elk Hills Stevens zone crudes. At the same time, Canal field also was put on that same basis, and the former separate schedule for Canal was discontinued.

Freight Rates Upped

Effective January 1, freight rates for the transportation of crude petroleum and petroleum products by rail or water will be increased approximately 20 percent under an order of the Interstate Commerce Commission. The 20 percent increase, however, may not exceed six cents per 100 pounds.

Department Expected to Reveal Today Procedure on Mother Hubbard Action

The Department of Justice today will reveal its intentions with respect to the Mother Hubbard suit.

Three courses are open: The Department may answer the interrogatories filed by Sun Oil Company and meet the demand of the other defendants for bills of particulars, or it may ask for a further extension of time, or move for dismissal of the case.

The consensus, based on disclosures of department thinking some weeks ago, was that the government would abandon the all-industry case in favor of suits, to be filed later and not necessarily in any one jurisdiction, against defendants individually and groups of defendants (THE OIL WEEKLY, October 28).

Experience with the case so far has shown that, with more than 200 defendants and a long list of alleged misdeeds, it is so cumbersome as to be unworkable. This was brought out when the defendants, answering the government's complaint last July, asked for bills of particulars against each individually. Sun Oil went even further and filed a lengthy interrogatory which the department found would take a score of writers to answer.

Advantages Seen

A program to break the case up into a number of smaller suits would give the department an "out" for its decision to withdraw the Mother Hubbard complaint, and would have several other advantages, among them the opportunity to weed out defendants against whom only a weak case could be made, such as The American Petroleum Institute; the inclusion of new defendants, said principally to be in the refining branch, and a more economical operation, since the suits could be filed as time and funds permitted. The department also would be able to inject some live issues into the litigation, originally instituted in 1940.

Meanwhile, in an address before the new Council of American Business in Chicago December 11, Assistant Attorney General Wendell Berge, head of the anti-trust division, raised possibilities that patent activities in the oil industry would be scrutinized closely.

The War Production Board revoked authority to enter into patent pooling agreements on September 15, 1945, without the knowledge of PAW and later there was an exchange of correspondence with the Department of Justice which resulting in a dating back of approval of an agreement which was in the making at the close of the war to bring it within the scope of the wartime authority.

Would Watch Activities

While the authority for the making of such agreements was terminated, the agreements made thereunder are effective for the life of the patents. Theoretically, this would mean a maximum of 17 years, but actually, it was said, the term may be several times that because of the general practice of industry of filing on "improvements" which serve the purpose of keeping the patent protection alive.

Accordingly, it is believed Berge's reference indicated that the department would watch activities under the wartime patent agreements to see that they are not abused.

South American Petroleum Meet Delayed Until June

The South American Petroleum Congress at Lima, Peru, has been postponed from first week in March to last half of June, the State Department has been advised.

No explanation of the postponement has been received, but officials suggest that it may have been due to the reluctance of Venezuela and Colombia to participate. Those countries, the principal producers in South America, are reportedly disinclined to discuss oil with countries which are purely consumers with little or no production of their own.

It was explained that there is no compulsion upon any country to participate in the meeting, which was not planned by a government but by an organization and the results of which will not necessarily carry any weight. The United States will not participate in the discussions, but will have at least one observer present.

New State Geologist

James M. Cunningham of Baton Rouge has been appointed acting state geologist for Louisiana, succeeding Paul Montgomery, who has been appointed to the directorship of Natural Gas Conservation for Louisiana. The appointments were effective December 15.

Cunningham, a native of Rayne, La., holds a degree in geology from Louisiana State University, has done graduate work in this field, and is a member of the state's Geological Survey.

Plant Disposal

The toluene plant at Baton Rouge, La., operated during the war by Standard Oil Company (Louisiana) has been declared surplus and will shortly be offered by WAA for sale or lease.

Imports Stressed in National Oil Policy Statement Made by Interior

Recommendations of the Interior Department with respect to a national oil policy were made public last week by OGD Acting Director Ralph K. Davies, simultaneously with release by the House oil subcommittee headed by Representative Clarence F. Lea of California of testimony taken during a two-day hearing last April, called for the purpose of receiving a final report on PAW's wartime activities.

Of current interest because of the imminent submission to the Senate of the final report and recommendations of that body's special petroleum committee headed by Senator Joseph C. O'Mahoney, which held extensive hearings over a period of months, Davies' recommendations listed as the most important points of any national oil policy: 1) development of domestic supplies; 2) maintenance of a vigorous domestic industry; 3) conservation of domestic resources; 4) more domestic areas to explore, including the continental shelf and the public lands; 5) development of synthetic liquid fuels, and 6) free access to foreign oil supplies. These recommendations are expected to be incorporated in the Lea report, to be filed shortly.

Davies pointed out that the success of any national oil policy is dependent upon a strong, vigorous and forward-looking industry, and, he said, "the incentives to find and develop oil must be such that the large and established companies will put forth their best efforts and the smaller companies may be encouraged to take the risks of exploration.

"Increases in all operating expenses undoubtedly make it cost more to find a barrel of oil today than in the years before the war," he added. "Capital will not be attracted to this business unless it offers an adequate return in consideration of the risks incurred."

Davies reiterated his suggestion to the committee last spring that since domestic demand is rapidly overtaking domestic production, imports of foreign oil can be expected to increase and it would be to the advantage of the United States to import rather than produce fields in excess of opitmum rates.

"Until a domestic reserve adequate for national defense is built up," he warned, "it is vital that the United States have safe access to large volumes of foreign production. Our war experience has shown how important it is to have a strong position in foreign fields and to have American companies vigorously active abroad.

"Such a position can be maintained only on the basis of a sound foreign oil policy backed by understanding and aggressive public opinion."

Equality of opportunity and international fairness toward our nationals are the two essentials of a sound foreign policy, he continued.

"The United States should insist that its citizens deal fairly with the governments under which they operate and that these governments deal fairly with them," he declared.

Jersey Standard and Socony-Vacuum Said Dealing for Saudi Arabian Interest

An agreement likely will be reached soon whereby Standard Oil Company (New Jersey) and Socony-Vacuum Oil Company will acquire an interest in the huge Saudi Arabian oil resources controlled by Standard Oil Company of California and The Texas Company through their jointly-owned Arabian American Oil Company.

No deal has been consummated, but it has been confirmed by some of the principals that there is a good possibility for an agreement whereby Jersey Standard and Socony-Vacuum would buy a portion of Arabian American stock. The original owners of the company likely would retain a majority interest.

It is also understood that such a transaction carries the approval of the State Department which recognizes the strategic as well as the economic importance of the reserves controlled by Arabian American. A large part of the Navy's fuel requirements are now being furnished from this source, it is understood.

From August, 1935, oil was discovered in Saudi Arabia, until March, 1938, the oil resources of the country were looked upon generally as being of minor importance. During this time five oil wells were completed as producers of limited potentiality in the same formations as those on Bahrein Island. However, in March, 1938, the deeper Cretaceous Limestone zone was opened which has since shown tremendous producing ability. Now three billion barrels seem quite conservative as the probable reserve.

Production has stepped up rapidly since the close of the war—from as low as 30,000 barrels daily early in 1945, to 150,000 barrels at the beginning of 1946 and a current 200,000 barrels daily. The new complete refinery at Ras Tanura is processing its full capacity of 90,000 barrels daily.

Iran Production May Top 1945 Mark By 5 Million

Iran's production for August amounted to 11,689,500 barrels, or slightly under the monthly average of 12 million barrels maintained for 1946 through August. On the basis of completed figures through August, which bring the year's total to 96,270,000 barrels, and estimates based on preliminary reports of present operations, it seems likely the output this year will exceed by 5 million the 1945 total of 140,525,000 barrels.

Oil industry operations are proceeding normally in Iran. A labor strike of short duration during July resulted in loss of perhaps 2 million barrels production, but since then there have been no stoppages.

For ten days during November, the Anglo-Iranian Oil Company's huge refinery at Abadan processed crude at the rate of 437,000 barrels daily, believed to be an all-time peak for sustained throughput for a refinery which operated at a rate of approximately 385,000 barrels daily during last year, and which under normal operations this year has been processing an average of about 400,000 to 410,000 barrels daily.

Swedish Pipe Line Rumored

The Swedish Minister of Finance recently is reported as having consulted leading industrialists about the possibility of constructing oil pipelines from Stockholm and Göteborg to Naerkoe in the interior, where an oil refinery and storage tanks might be erected.

Further Gain Is Seen in Venezuelan Oil Workers

There were 30,291 people employed by the various oil companies operating in Venuezuela at the close of 1945, with preliminary surveys indicating a considerable increase for the current year.

According to "El Farol" Creole Petroleum Corporation house organ, employes increased 7579 during 1945, and the number at the end of 1945 was almost double the number working at the end of 1942. Following is the record for the year 1939-1945:

1939	22,393
1940	18,546
1941	18,835
1942	15,532
1943	16,302
1944	22,712
1945	30,291

The drop in personnel from 1939 to 1942 reflects outbreak of hostilities in Europe followed by decreased activity due to shortage of materials and transportation. Following this was the gradual increase as Venezuelan production became more important to the allied war effort. The pronounced jump in 1945 was in support of postwar activity, during which a number of new companies started operating, and all firms opened up to full operating levels.

Fourth Springhill Test Nearing Projected Depth

Outcome of the fourth oil test in the Springhill area of Chile, on the island of Tierra del Fuego, is expected to be known soon.

This well, being drilled by Chilean Corporacion de Fomento de la Produccion, was scheduled to be near the sand expected just above 7500 feet with indication that it is running favorably on correlation with the discovery well.

Expansion in activity in this region is assured now, with the government agency's purchase of two new extra-heavy duty power rigs, now enroute from the United States. Operation will be under the direction of George P. Livermore, Inc., drilling contractor.

Continued Decline Shown In German Oil Production

Crude oil production in the British Zone of Germany for the 10 months period ending October 31 totaled 547,639 metric tons (about 3,833,473 barrels), the British Control Commission for Germany has announced.

This represents a continued decline in output and is attributed to the deterioration of machinery in use, lack of manpower, accentuated by the lack of food, and the lack of transportation.

The oil requirements for the whole of Germany are about 2,150,000 tons (17 million barrels) of refined products annually. A fairly intense drilling program is being conducted in the British Zone in an attempt to bridge the large gap between present production and the overall oil needs, which must otherwise be met by imports. An average of 16 rigs are working on exploratory tests with 100 rigs drilling in known fields.

The Hannover-Braunschweig area is curently producing 71 percent of the oil in the British Zone with the Schleswig-Holstein area 11 percent, Westphalen 10 percent, Luneburg 6 percent, and Olderburg-Ostfriesland, 2 percent.

Oil production in the British Zone the first 10 months of 1946 follows:

MONTH, 1946	Tons	Barrels
January	53,642	375,494
February	48,720	341,040
March	56,794	397,558
April	54,522	381,654
May	59,469	416,283
June	55,670	389,690
July	56,692	396,844
August	55,795	390,565
September	53,498	374,486
October	52,837	369,859
Total	547,639	3,833,473

Gas Well In Poland

An important new gas strike has been made in Poland. It is in Silesia near Skoczow in extreme western Poland, more than 75 miles west of the nearest previous producing area. The wildcat, Dembowiec 1, flowed approximately 100 cubic meters (3530 cubic feet) of gas per minute from a depth of 396 meters (about 1300 feet). After striking gas rotary equipment was moved in, and the well will drill deeper.

Gas Producer Near Vienna

A new gas well has been successfully completed near Vienna by the Soviet Crude Oil Administration. Initial output was 40,000 cubic meters (1,412,000 cubic feet) a day, which figure is expected to be increased to 50,000 cubic meters (1,765,000 cubic feet).

Pantepec Discovery

Pantepec Oil Company of Venezuela's No 1, on the Pelayo concession in Venezuela, jointly owned by Pantepec and The Atlantic Refining Company, has been completed to open a new field.

On a 7-hour test, the well is reported to have produced at the rate of 425 barrels of 30.5-gravity oil daily with 700 pounds pressure from 7473-88 feet.

Big Inch Gas Delivered Ahead of First Schedule

Texas gas began reaching Ohio consumers of Tennessee Gas & Transmission Company's customers through the Little Big Inch on December 11, two days ahead of the probable date set by TGT engineers. Approximately 50,000 Mcf of the gas was being made available daily, with another 60,000 Mcf on its way toward the same area via the Big Inch line through connections into that carrier at and near Longview.

Deliveries of gas through the two War Emergency lines, although in part expedited by the coal strike, will serve to alleviate the gas shortage in the Ohio-West Virginia area for the duration of the four months' emergency lease. Inasmuch as the gas is being burned principally in industrial plants in which the primary power is derived from coal-burning installations, restoration of coal deliveries will augment, rather than decrease, gas demand from plants equipped to use natural gas in process operations.

Explosion of a feeder line from the Carthage field to a tie-in with the Big Inch at Longview did not delay utilization of the 24-inch line, but merely set back by a few hours the boosting of input which ultimately will enable the two WEP lines to carry approximately 150,000 Mcf to Ohio distribution points at a delivery pressure in excess of 150 pounds gauge. Delivery is being made at Middletown and Lancaster, Ohio, and Moundsville, West Va.

Cities Service Outlines Plan for New Gas Project

Urgency of its need for an additional 26-inch pipe line from the Hugoton gas field to Kansas City, as well as its vast reserves in that field, highlighted the presentation last week of the case of Cities Service Gas Company before a Federal Power Commission examiner in Kansas City. Testimony also was started on an application for expansion by Northern Natural Gas Company of Omaha.

Cities Service is seeking to build and operate a 405-mile line and S. B. Irelan, Oklahoma City, president of Cities Service Gas Company, and B. C. Adams, Kansas City, Mo., president of Kansas City Gas Company, Wyandotte Gas Company and Gas Service Company, told of the prospective increasing demand for gas within the next five years.

Irelan said his company showed the potential peak day demand had increased from around 418 million cubic feet in 1939 to around 697 million cubic feet in 1945 and the 1946-47 estimate was for 853 million cubic feet, a 104 percent increase over 1939.

Plans for financing the proposed $30 million additional pipe line were outlined by John M. McMillin, New York, a Cities Service vice president.

Ray T. Wells, Oklahoma City, chief engineer of Cities Service said by 1951 a peak day demand will have risen to more than 1 billion cubic feet, with the system delivering only 886,447,000, unless additional facilities are supplied.

The proposed line, of 26-inch pipe, would originate in Grant County, Kansas, in the northern sector of the rich Hugoton field, and run near Hutchinson, Newton and Ottawa to Kansas City.

Cities Service and the Northern Natural firm filed separate motions asking the FPC to dismiss the application of the Mid-Continent company to construct an 836-mile pipe line from the Hugoton field to St. Paul, Minn., saying Mid-Continent had failed to establish that it had the ability to consummate and support its proposed $90 million project.

Shell Plans Products Line From Sheridan to Refinery

Shell Pipe Line Corporation has placed orders for pipe for the construction of a 110-mile, 6-inch products line to extend from Shell Oil Company's natural gasoline plant in the Sheridan field, Colorado County, Texas, to the latter's refinery near Houston.

Right-of-way is being purchased for the line, which will extend northeast from Sheridan to Brookshire station, in southeastern Waller County, thence parallel to the company's Permian Basin 10-inch crude carrier to the refinery. This routing will permit the line to traverse the Katy gas-distillate field, where additional products may be obtained later.

The Sheridan plant is processing 80 million cubic feet of gas daily, and at present is dependent upon tank cars for delivery of its production to the Houston plant. The products line is scheduled to be completed within 6 months. Use of a single booster station is planned.

FPC Staff Cut May Delay Submission of Gas Report

Drastic reductions in the government's administrative and legal staffs handling the natural gas investigation have been made recently by the Federal Power Commission which likely will delay FPC's report and recommendations until several weeks after Congress has convened.

The last of the attorneys handling the gas probe were off the public payroll last week and several administrative assistants are preparing to depart.

The delay in the report expected to result from the staff cuts would give FPC an opportunity to study the trend of the new Congress before making the final draft.

Pipe Line Outlet for Block 12

The Texas-New Mexico Pipe Line Company has provided a pipe line outlet for the Block 12 field, Andrews County sector of West Texas, through the construction of 13 miles of combination 6- and 8-inch trunk line to its booster station in the Dollar Hide field, situated in the southwest corner of the county. The Block 12 field has 16 flowing and pumping wells in the 7200-foot Clear Fork scattered over 7 sections. The oil varies from 32 to 36 degrees gravity, averaging above one percent in sulphur content.

Sinclair Buys Gathering Systems in North Texas

Sinclair Refining Company, Pipe Line Division, has acquired two crude gathering systems in eastern Cooke County sector of North Texas that have been making deliveries to the company's trunk line that serves its Fort Worth refinery. The company purchased the Cooke Pipe Line Company's system in the Wilson 75-well field, including 6 miles of 2, 3 and 4-inch line. This circuit was connected with the nearby Woodbine field when the Northern Ordnance, Inc., disposed of its lines that serve 23 wells.

Oil Purchaser Proration Move Temporarily Passed

Humble Oil & Refining Company has been temporarily relieved of the necessity of adopting purchaser proration in the New Mexico and West Texas area due to excess gatherings through the sale of 9000 barrels of oil daily to The Atlantic Refining Company, Magnolia Petroleum Company and Stanolind Crude Oil Purchasing Company.

Production increases granted December 1 by state authorities boosted the allowables of leases served by Humble Pipe Line Company to 14,000 barrels above the capacity of its two trunk lines, which are handling 110,000 barrels daily. All pipe line outlets are operating at capacity.

New Gas Line to Denver In the Discussion Stage

Plans for the construction of a new $12 million natural gas pipe line which would approximately double the volume of the fuel available in Denver, are under discussion by the Public Service Company of Colorado.

Under terms of a new 20-year contract between the company and Colorado Interstate Gas Company, Interstate will undertake to construct the new line so that gas from it would be available in Denver not later than October, 1947. The line would run either from the Hugoton, Kansas, gas area, or from the Amarillo, Texas, area, and would have an ultimate capacity of approximately 150 million cubic feet per day.

Horner to Speak

William L. Horner, manager of the secondary recovery department of Barnsdall Oil Company, Tulsa, will discuss "Peak Profits by Water Injection in Oil Fields" before the Oil and Gas Division of the Oklahoma City Chamber of Commerce December 16.

Horner will also talk at a meeting of the Petroleum Engineering Society of Oklahoma in Oklahoma City, December 18.

Pipe Line Party

Smith Contracting Company held its seventh annual pre-Christmas party December 7 at Fort Worth, honoring the personnel of the pipe line industry. About 500 guests attended.

Compact Commission Picks Dow as Its New Chairman

By WELDON B. HILL, Staff Writer

ALTHOUGH forecasting an increase of about 140,000 barrels daily in the demand for all oils in 1947, the Economics Advisory Committee to the Interstate Oil Compact Commission believes production required to meet the estimated demand will be about 90,000 barrels daily less than the average in 1946.

The forecast was contained in a report by the committee at the winter quarterly meeting of the Compact Commission last week in Dallas.

The 1947 demand of an estimated 5,425,000 barrels daily will be influenced by business conditions generally, and a recession might result in low demand while a sharp improvement in business might cause demand to be above the estimate, the committee, headed by Dr. Richard J. Gonzalez, Humble Oil & Refining Company, Houston, reported.

Regarding the revised Anglo-American Oil Treaty, the commission by resolution urged that recommendations "be left to the respective member states, and not be made by the Interstate Oil Compact Commission as such."

State Control Favored

The Commission reaffirmed its position of "opposing the invasion by or vesting in any other agencies of any jurisdiction over or control of conservation of their natural resources now exercised by the various states."

Commission members by resolution called for the chairman to "appoint a committee to study the problem of obtaining maximum recovery of oil from the stripper reserves, and work with such other agencies and organizations conducting similar investigations."

J. Howard Marshall, president of the National Stripper Well Association, and Don Andrus, Pennsylvania's compact representative, thought it was proper for the Commission to interest itself in the conservation of stripper reserves.

Ernest Shamblin, executive manager, National Oil Conservation Committee, declared that the most practical stimulant presented thus far toward preservation of the stripper well reserves seems to be in the form of a conservation payment "so often suffering under the misnomer of a subsidy."

"Since the Commission has arisen to all other occasions and solved other wasteful practices within the industry, it can be relied upon to assist in the solution of this problem," Shamblin said.

E. C. Arnold, supervisor of oil and gas operations of the Osage Indian Agency, declared that if conservation payments were in the interest of the national security and welfare then he favored them.

H. J. Porter of Houston, president of the Texas Independent Producers' and Royalty Owners' Association, opposed federal subsidy payments in any form.

Olin Culberson, chairman of the Texas Railroad Commission, feared that subsidy pay would invite federal control.

Governor Robert S. Kerr of Oklahoma, retiring Compact chairman, declared he personally favored conservation payments but said that "if we couldn't have conservation payments without federal intervention I would oppose them."

Ernest O. Thompson, Texas Railroad Commissioner, predicted that 1947 should be one of the best years of the oil producing industry's history. Continued strong demand was assured by more automotive units coming into use he said. Thompson also predicted that crude prices will increase during the year, citing the constantly mounting drilling costs of deeper wells to get oil.

He also said it was his opinion production cuts of 350,000 barrels daily should be made immediately, with "still further cuts if necessary."

Harold B. Fell, executive vice president of the Independent Petroleum Association of America, reported that the December supplement to the October, 1946, report of the association's supply and demand committee shows that "prospective requirements of the next four months indicate the need for a substantial reduction in U. S. crude production of more than 400,000 barrels per day from the November levels."

Robert L. Thornton, president, Mercantile National Bank, Dallas, spoke on "Looking Ahead" at a banquet given by the Dallas Chamber of Commerce.

Tom Clark, U. S. Attorney General, said in a paper read by Payton Ford, that "the domestic industry should not be faced with the ruinous competition of cheap foreign oils and at the same time our reserves should not be depleted to supply the world without compensating imports." He thought it fortunate that "thus far the good work done by the conservation authorities has prevented us from being forced to import our crude supplies."

Proper reservoir control is the most important conservation concept of the conservation of petroleum resources and should be practiced as early as possible in pool development, Don R. Knowlton, Oklahoma City consulting engineer, told the commission.

"No more remunerative field of endeavor is open to the states and producing branch of the oil industry today than the furthering of conservation by promoting primary pressure control and secondary recovery operations utilizing all known physical and scientific facts," Knowlton said.

He urged the Compact Commission to study state statutes and make recommendations for constructive legislation permitting and encouraging unitization of oil fields and pointed out that no state has a law stimulating to the greatest possible degree the undertaking of a pool-wide unit operation.

The technique for statewide gas proration, when feasible, should follow substantially the same plan adopted for oil proration, Jack Baumel, chief engineer of the Railroad Commission of Texas, told the Compact Commission. (See page 50 for full article.)

Secondary Recovery

A thorough survey of best possible means of establishing secondary recovery facilities was suggested by the Compact's research and coordinating committee. It also reported that before salt water disposal programs are inaugurated, every possible effort should be made to utilize the brine for pressure maintenance and secondary recovery operations. Sub-surface disposal of salt water was recommended over other

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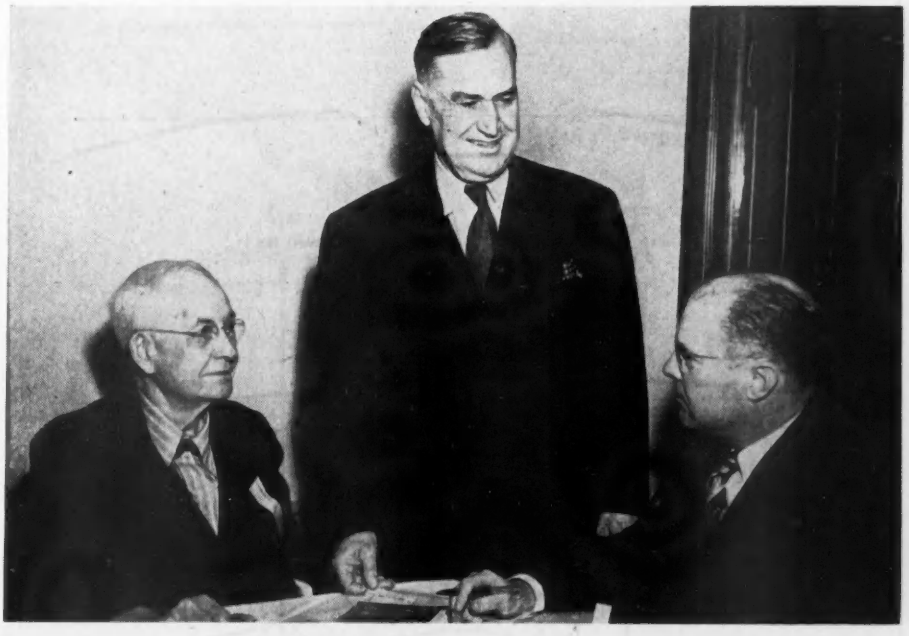


Hiram M. Dow, center, New Mexico's representative on the Interstate Oil Compact Commission since its formation, was elected Commission chairman succeeding Governor Robert S. Kerr of Oklahoma last week in Dallas. Clarence T. Smith, right, Illinois, was named first vice chairman succeeding Dow. Warwick M. Downing, left, Colorado, was reelected second vice chairman, and Earl Foster was renamed executive secretary. The executive committee hereafter will comprise representatives from Texas, Oklahoma, Kansas, New Mexico, Louisiana, Illinois and Arkansas, but these will not be named until after the several governors take office.

STRUCTURAL CORRELATION OF

Micromagnetic and Reflection

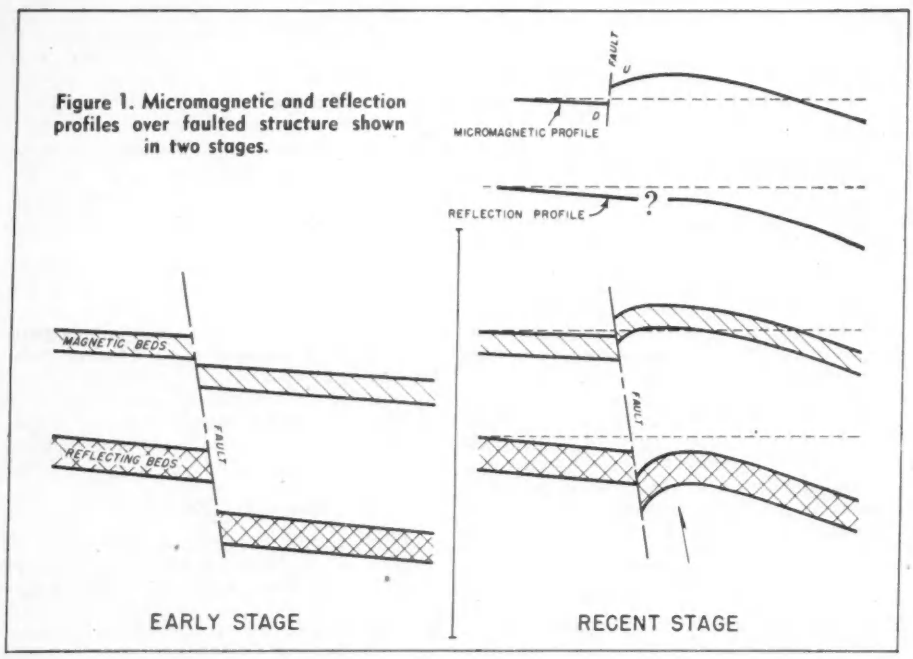


Figure 1. Micromagnetic and reflection profiles over faulted structure shown in two stages.

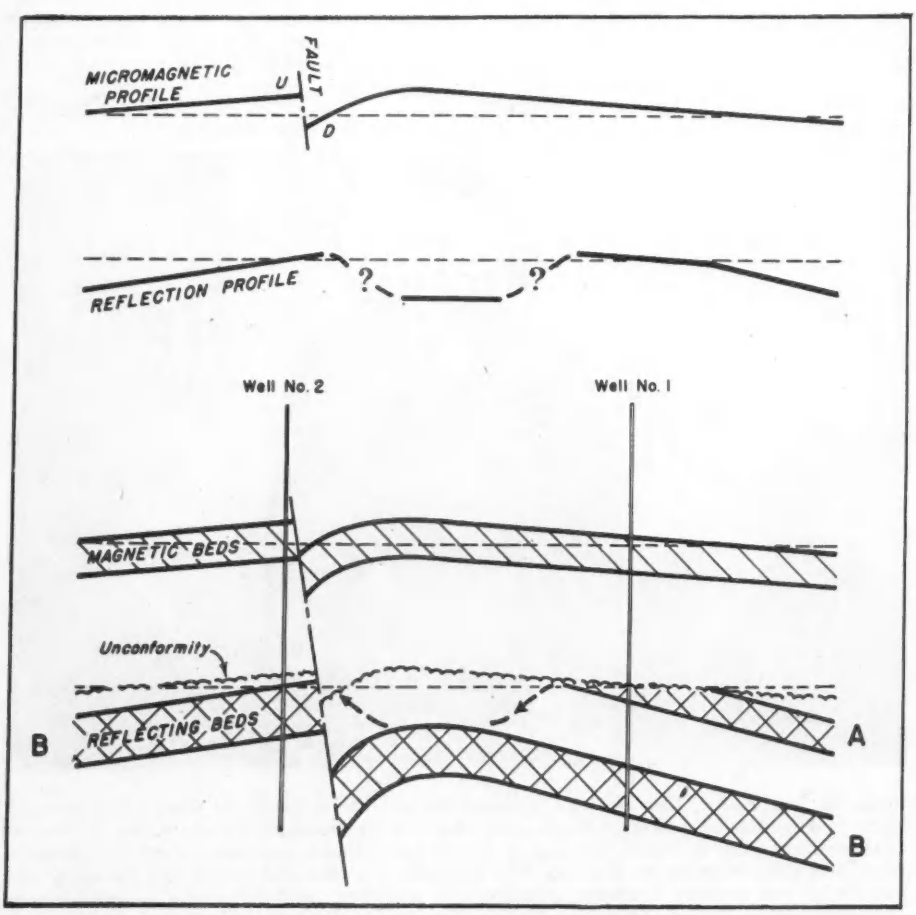


Figure 2. Micromagnetic and reflection profiles for Wilcox structure.

IT HAS been pointed out in a recent paper[1] "that large domes sometimes govern their own sedimentation and deposition." To a limited degree this probably is true also for small domes and other types of structure.

Periods of growth, quiescence and subsidence of a local structure may bring about stratigraphic and lithological changes in the overlying sedimentary column, as compared with the surrounding normal deposition.

It thus stands to reason that the reflection method, which measures the depth to certain reflecting beds or series of beds with great accuracy in areas of normal deposition, may encounter difficulties in correlating reflections over local structure.

Multiple recording and continuous profiling are of great help in overcoming such difficulties but, obviously, certain local conditions of sedimentation may occur which will defy solution by the reflection method alone.

In such instances the micromagnetic method may prove to be of considerable assistance.

In recent years the core orientation method has shown that magnetic properties are more common to sedimentary rocks than has been generally realized, and successful micromagnetic interpretations have proven that certain sedimentary beds or series of beds are sufficiently magnetized to serve as key-horizons for micromagnetic surveys.

The main magnetic beds may lie above or below the main reflecting horizons, or the same series of beds may constitute the main reflecting as well as the main magnetic horizons. The latter condition occurs for example on certain structures along the lower Wilcox trend. But, obviously, possible changes in the sedimentation above local structure may affect the magnetic properties of the same series of beds in a different way, than the reflecting properties of these beds.

Structure in Two Stages

In Figure 1 are shown two stages in the development of a structure. At an early stage the structure is indicated as a fault. The reflecting beds show more displacement than the magnetic beds.

Due to later salt movements the downthrown side of the fault is pushed up, the reflecting beds are lifted to their approximate original position, the magnetic beds above their original position.

With a few inconclusive reflections in the fault plane, the relection profile may conceivably cross the structure without much indication of local structural closure. The magnetic horizon is sufficiently displaced to indicate faulting and structure.

Wilcox Structure

In Figure 2 the reflecting beds A are eroded on the upthrown side of the fault and also over the top of the structure.

Data

By W. P. JENNY
Consulting Geologist and Geophysicist

With some questionable reflections in the fault plane the reflection profile may conceivably indicate two structural highs, one each to the north and south of the structure. The magnetic beds have been deposited, faulted and folded during later stages in the development of this structure and the micromagnetic profile will indicate the apex of the structure between the two reflection highs.

Frio Structure

Figure 3 illustrates a sedimentary condition for a Frio structure in the Gulf Coast and may offer a possible explanation, why a considerable number of fair-sized fields have been found or missed by edge wells.

The main reflecting beds A have been eroded over the structure and conceivably the reflection profile may indicate two highs, both on the edge of the structure.

The main magnetic beds have been uplifted and thinned out over the structure. The structural high is therefore indicated in the micromagnetic profile by a negative anomaly.

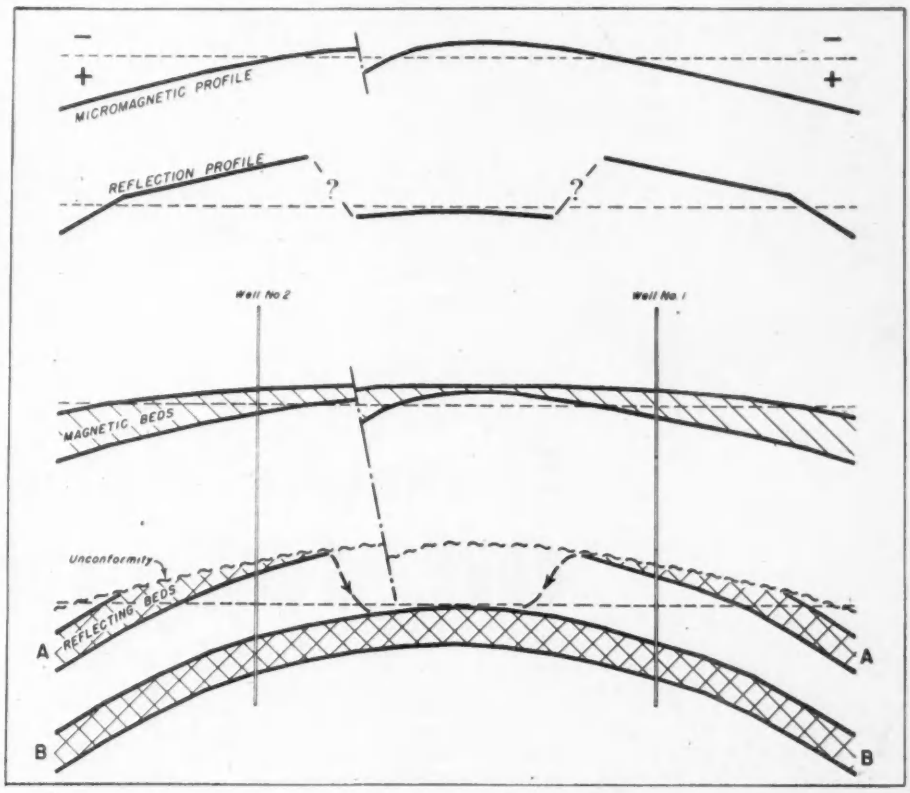


Figure 3. Micromagnetic and reflection profiles for Gulf Coastal Frio structure.

Practical Example

That a correlation of micromagnetic data with other geophysical and geologic data may offer some promise for a solution of such problems, is possibly suggested by the example in Figure 4.

The micromagnetic data were surveyed and interpreted in 1936. A structure is indicated on the downthrown side of a fault. Until 1945 there have been drilled six deep tests in this area, obviously without the "benefit" of a micromagnetic correlation. The prospect is still active and the micromagnetic structure still warrants a test. As the prospect stands today, it may be seen that one well would have been sufficient to test the micromagnetic interpretation and that a number of the dry hole locations were not recommendable from a micromagnetic point of view.

The greater cost of a geophysical method is no guarantee for its superior performance under any geological condition.

In fairness it should be stated that certain general or local conditions of sedimentation may work in favor of the reflection method and against other geophysical methods. This point has, however, been overemphasized to such an extent during the past fifteen years that it hardly needs further stressing.

Moreover, the purpose of this paper is not to advance one method at the expense of another, but rather to point out that a correlation of two methods may solve certain problems, which defy solution by one method alone.

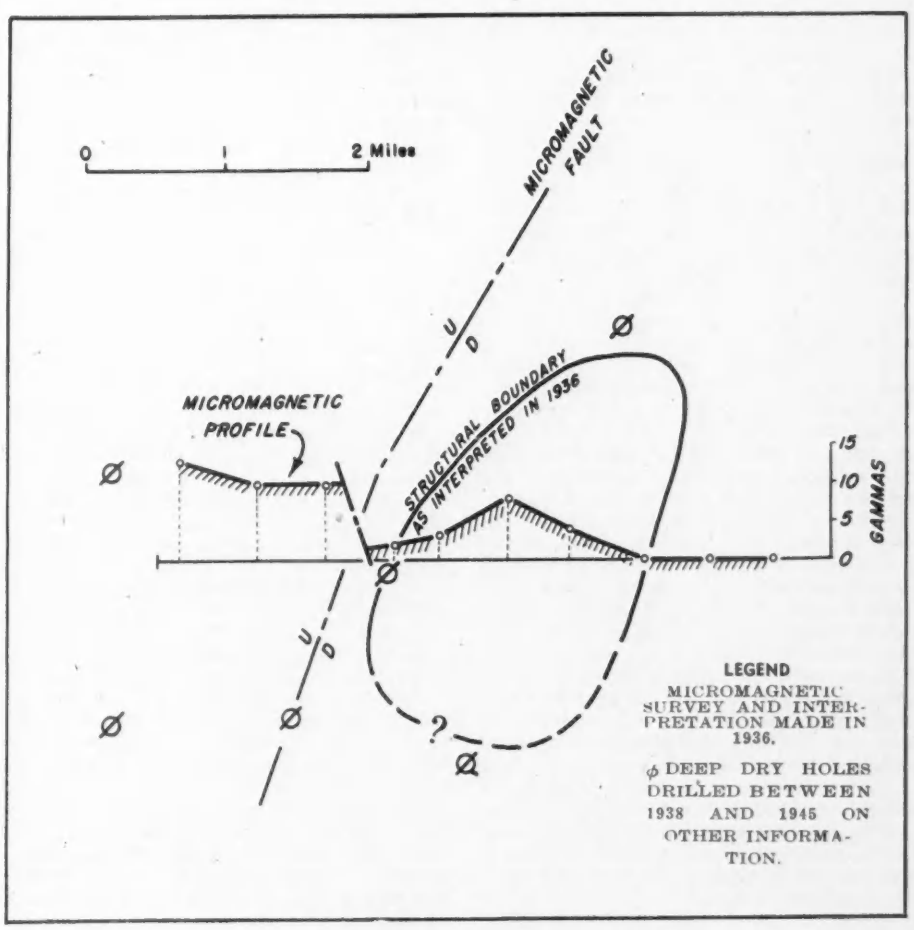
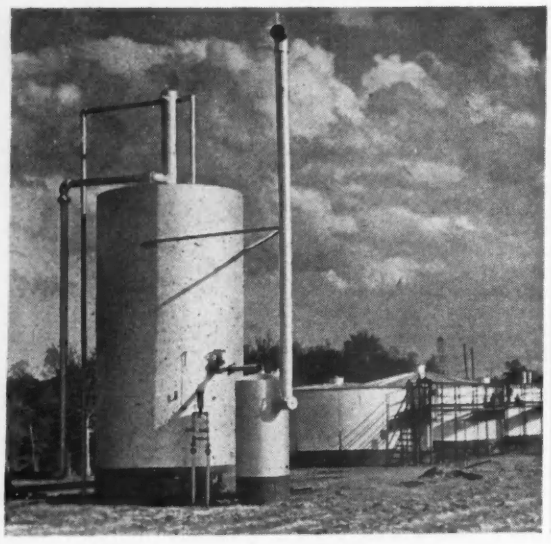


Figure 4. Frio prospect.

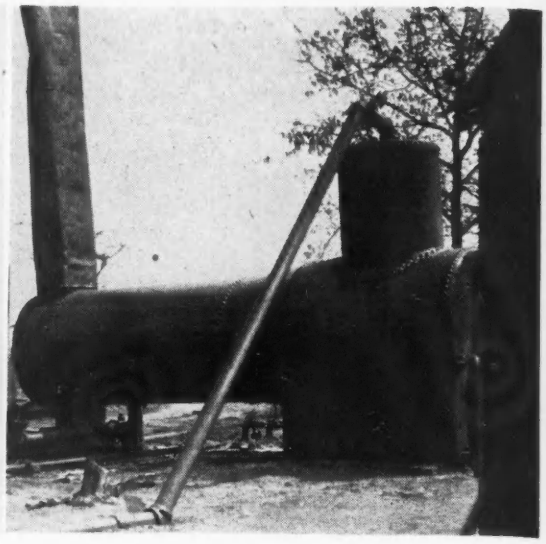
REFERENCE

[1] Cecil Hagen and Ralph Cantrell, Development, Trends in Salt Dome Exploration, The Oil Weekly, September 16, 1946.



Left, modern treating plant with thermostatic control.

Right, Treating plant 15 years ago.



Economics of Modern OIL TREATING

By R. R. MacDONALD
Oil Treating Engineer, Cushing, Oklahoma

ALTHOUGH the oil industry has made rapid strides in many phases of production practice, it is by no means taking full advantage of modern and improved methods of treating oil in the field. This is strange indeed since clean oil is the ultimate end product of all field operations and frequently an increase of a degree or two in gravity means considerable money to the operator.

In a recent survey of Oklahoma oil fields the writer discovered that a majority of pumpers did not know they had bad oil in their tanks. They admitted they usually discovered this condition only after their tank batteries were full and they found themselves in a jam. Usually, when the trouble showed up, the pumper sent a hurry call for a chemical treater who, in turn, found few conveniences to work with and was always pressed for time and anxious to get through with the job as quickly as possible. Not infrequently, after subjecting the oil and the chemicals being used on the lease to a series of routine tests, the treater found that the chemical was no longer as effective as formerly, or reported that the battery was full of unclean oil because the chemical pump had failed to perform properly. The next step is to borrow a portable treater which is usually found many miles from the lease. The tanks are "rolled cold," necessarily using an excessive amount of chemical, and the bill is sent in. The cost? We'll forget that because the oil was turned into the pipe line. But an efficient superintendent cannot lightly dismiss the item, for with the same trouble recurring from time to time, he will soon find that his operating costs are mounting to a point where they may become embarrassing to explain to the front office.

Another factor frequently overlooked in treating operations is lost production. Down time is also an expense that must not be overlooked. A lease superintendent can feel no satisfaction in knowing that oil which should rightfully be on his run tickets has gone to his neighbor because of carelessness in providing adequate facilities for treating his oil and resulting in down time, plus additional service expense. A pumper recently advised the writer that in addition to the cost of new chemical, trucking costs and labor, the lease had lost 200 barrels of production valued at $350.

The above example is not an exception, but rather it is the rule on many leases. Treating difficulties which could be avoided are happening every day and in every oil pool throughout the country. Losses in time and production cannot be calculated but, in the course of a year, they must be very great.

Divided Responsibility

The pumper alone cannot be blamed for this situation. His foreman is equally at fault and the foreman's superintendent must also come in for a good share of the blame. This brings us pretty close to the top, where the main fault lies. No single individual can be held responsible because the problem is one that must be met and solved by the foremen and superintendents in the various districts. It is not good practice to "pass the buck" to company engineers since they have other, and weightier problems to solve. As a rule, no adequate records are available because too many are involved and in the final analysis the cost is written off as lease expense and forgotten.

A well organized and integrated company employs linesmen to keep the company phones in operating condition; painters and carpenters to maintain buildings and attend to repairs; mechanics to keep up machinery. But seldom does it designate an individual with the full responsibility of seeing that the oil is kept clean and is run without interruption. It is equally important to have the oil run at its highest gravity and at the lowest cost, and gravity is partly determined by its cleanliness. Only an experienced treater can adequately perform the functions which are generally handled by several lease men, none of whom are experts in this highly technical phase of oil production.

During a recent bitter winter in Kansas, a major oil company not maintaining an individual oil treater ran the entire allowable of 71,535 barrels of oil produced by a smaller concern that did have an oil treater, while it was shut down itself half the time and running only about half of its own allowable. The smaller concern produced 74,063 barrels of flowing cut oil, recovering 97 percent (71,535 barrels) at a cost of .0241 cents per barrel. The oil was produced from four adjacent leases, each having a high 300 or 500-barrel wooden receiving tank. Pipe line company requirements stipulated oil containing less than four-tenths of 1 percent water.

The first week found this oil going to stock at four-tenths water and consequently was rejected by the pipe line company. The oil treater immediately installed thermal type heaters to the wooden receiving tanks plus "boots" to eliminate agitation from the receiving tanks, thus converting them into treating tanks. Approximately 40 feet of line to and from the wooden tanks and connecting the heaters was insulated with asbestocel. The heaters were installed far enough away to overcome a possible fire hazard. While this type of treating system was not the most efficient system, it did the job at the lowest cost per barrel compared wih the more costly plants on the market. In this instance the ingenuity of the individual oil treater was taxed to afford performance with the tools at hand and he came through.

In assaying the cost of this operation the wooden receiving tanks were charged against the treating department as were the lines, insulating material, heaters, connections, trucking, labor, chemicals, chemical pumps and the oil treater's time and expenses while on the job. The costs were $800 for the 300-barrel and $950 for the 500-barrel receiving tanks. This meant that over a five-year period the depreciation alone on each plant amounted to only from $13 to $15.50 per month.

At the same time it must be borne in mind that the problem on this lease involved a tight "flowing emulsion" and not a loose "pumping emulsion." Potentials were taken through these makeshift plants at the rate (high) of 80-90 barrels per hour and (low) of 36-40 barrels per hour with the atmospheric temperature at 12° F. below zero. They performed satisfactorily in all instances.

While the importance of recovering 97 percent of the runs at a low cost of 0241 cents per barrel cannot be minimized, the significant features of this operation are summed up in the knowledge that the entire allowable was run under the most severe winter conditions at a nominal cost and that no production was lost to a rival lease.

About 15 years ago ratios of chemical to oil were accepted at one gallon to 100 barrels of oil. Today there are many chemicals on the market that give a ratio of one gallon to 600 barrels and some go as high as one gallon to 1200 barrels.

This improvement in chemical strength and efficiency is going on continually but few leases are taking full advantage of the progress made because routine tests are seldom made to determine the most efficient chemical for a particular type of oil. As a general rule a single test is made during the initial production period and from then on the same chemical is ordered year after year because it does the work. If routine checks were made periodically, more efficient chemicals could be ordered and treating costs cut proportionately. There are some exceptions to this rule, but they are rare.

Chemical pumps also have undergone considerable improvement during the past few years and there are some pumps on the market today that, with proper care, will deliver less than one-half pint of chemical over a 24-hour period. Yet, this advantage has not become universally recognized. As general practice the chemical pump is set to deliver approximately three gallons per day for a lease producing about 600 barrels of oil daily. However, when production declines, due allowance is seldom made and the same quantity of chemical is passed through the pump. Careful checking by an individual oil treater with full responsibility undoubtedly would save many dollars in chemical costs. Consider a lease which originally produced 600 barrels per day and which has gradually declined to 400 barrels. An efficient treater, by a simple adjustment of the chemical pump, could save his company a third of the cost of chemicals which, in this case, would amount to about $2.15 per day or approximately $800 per year.

Pump Care

Obervations in the field cannot but reveal that the average pumper, with a multitude of other duties to perform, fails to care for his chemical pumps as he should. These pumps are usually set out in the open where the winds blow sand or dust which adheres to the chemical that has been spilled on them while filling or where it has leaked out through faulty packing around the plunger. Oil cups are frequently filled with gritty oil and grease. Sand and dust often cut working parts unmercifully, and it is no wonder that when the pump is called into full-time service to treat a stock tank of bad oil, it fails to perform and is "cussed" roundly by the crew for not working properly. Chemical pumps deserve the same good care that is given to other pieces of machinery and lease equipment. An occasional cleaning, tightening up, adjusting and the replacing of worn parts will pay good dividends. They should not be set up in the open without some shelter. A half-drum can form a good protector against sand and dust. An ideal location for the chemical pump is inside the motor or engine house where the warmth will keep the chemical more fluid.

Beam pumps, on the other hand, often must be set out in the open in order to have the reciprocating motion of the beam. While they are less expensive and have fewer working parts than the more elaborate gas driven pumps, they play an important role on the lease and their life and dependency can be increased immeasurably with a little daily attention.

Beam pumps can frequently be set inside the motor house with the reciprocating arm attached through the wall by a ⅜-inch rod connected to a small crank on the shaft. Here again the warmth of the enclosure is a decided working advantage.

Treating plants have also undergone considerable improvement during the past few years. In treating this oil the operator should avoid too high a temperature. Regardless of how closed the new plants may be, if the ejected oil is not cooled before it goes into stock, it will suffer a heavy gravity loss. It is generally accepted that for each degree of gravity lost 2½ percent by volume is lost also. The importance of this point can be appreciated in the case of a lease making, say, 500 barrels daily. If but one degree of gravity is lost through careless handling and high temperature, the loss represents $10 in gravity alone plus $18.75 in volume, or a daily loss of $28.75, assuming the oil to be worth $1.50 per barrel. This loss amounts to $862 a month, more than ample to pay the salary of an expert individual oil treater. Some operators may disagree with this calculation but one, two or three-tenths of a degree on several leases poses the same problem and results in similar losses when a treater is not competent to handle the heat factor connected with his problem.

Profit in Clean Oil

Clean oil means money on the books

When oil is run at 1 percent it can often throw the price into the next higher bracket if cleaned to one-half of one percent through the addition of a little more chemical. Assume that an operator receives $158 for 100 barrels of 39.7-gravity oil treated with one quart of chemical costing .54 cents, the oil going on the line at 1 percent. By using 1½ quarts to more thoroughly clean the oil at a cost of 81 cents the operator can run his oil in the next higher bracket, which is 40-gravity and receive $160, a profit of $1.19 on the hundred, plus the fact that he can fill his stock tanks twice as often without having to clean a "high bottom." This saving can be multiplied until it represents an appreciable sum.

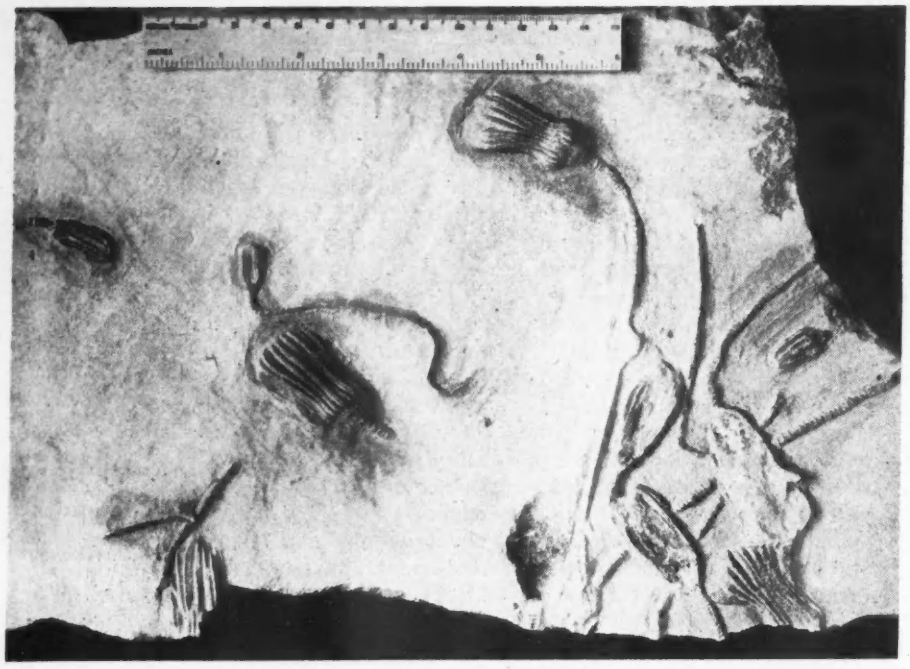
In driving around the oil fields an observer daily sees spirals of smoke on the horizon. These are "high bottoms"—draw off—waste. While this type of waste cannot entirely be eliminated, it can definitely be reduced by correct treating. Of necessity, oil carrying one to two-tenths of one percent will, over a long period of time, build up a bottom. All of it does not drop out, but some of it does. On leases where treating tanks are available, there is no problem in recovering these bottoms. They are simply pumped back through the plant. On leases where no plant is available these bottoms should be collected in a sump tank and treated when enough has accumulated to warrent the cost of picking up and rolling out.

There is entirely too much waste associated with oil treating and only when operators realize that this production phase merits special study will most of the present waste be eliminated and additional dollars added to the annual profit take.

About the Author

ROBERT R. MacDONALD, oil treating engineer of Cushing, Okla., was destined to become a geologist, but after studying three years at the University of Chicago, he was lured from his books to enter the oil industry in Oklahoma. There he has remained since 1923, becoming an expert in oil treating. He went to work for Shaffer Oil & Refining Company at Drumright, Okla., as a roustabout, but after six months was sent to Cromwell as assistant drilling superintendent and saw that major oil field developed. From drilling he was transferred to production and sent to Seminole, where he became interested in oil treating in 1928 and has since devoted himself to that phase of production. MacDonald, who went with the Deep Rock Oil Corporation, successor to Shaffer, estimates he has treated an average of 150,000 barrels of oil per month for the past 18 years. He has made a special study of oil treating equipment and has also designed and patented such equipment. MacDonald resigned last August from Deep Rock but his interest in cleaner oil is unabated.

Robert R. MacDonald



Slab of Mississippian limestone from near LeGrande, Iowa, containing a number of crinoids. These are important Mississippian fossils. (Specimen in Colorado School of Mines Museum.)

Paleontology

By J. HARLAN JOHNSON
Colorado School of Mines

YEARS ago while collecting fossils, the writer was interrogated by a farmer who wished to know what he was doing. On being told, the farmer looked him over and said severely, "Young man, you ought to be ashamed to waste your time in that way! Why don't you do something useful?"

Today, even in the oil industry, there are people who have much the same idea as the farmer. Recently, I heard a self-styled practical oil man say, "We do not need to bother with paleontology. We have geophysics and electric well logs." However, in spite of such comments, we see all the larger companies hiring more and more paleontologists and building larger and better laboratories for them. Knowing this, the public will probably echo the statement of one of our freshmen who visited such a laboratory, then said, "It's all a mystery to me, but you can bet your last dollar hard-headed businessmen would not spend money regularly on such things if they did not get a big return for the investment."

Applications to Geology

Paleontology supplies the basis for dating the sedimentary rocks, and in so doing furnishes the data for widespread correlation. Over two centuries ago, Adam Smith, an observant English civil engineer, noted that the fossils which ocurred in the various formations in southern England were different one from the other, so that he could tell the formations apart if necessary by the fossils which they contained. Since then, geologists working in all parts of the world have accumulated an enormous volume of data which have been woven together to give us our picture of geologic history.

In studying historical geology from a philosophical viewpoint, one is able to make a number of broad generalizations. Among the most interesting of these are those which deal with the spread and development of living forms. We observe among other things that throughout time organisms have tended to develop, change, and adapt themselves to their environmental conditions. This development has tended to follow certain definite patterns with the more progressive forms constantly developing more and more complex structures which enables them to make more thorough environmental adaptations.

As a result of these tendencies, we find that for any given time, the assemblage of living forms was different from the assemblage of any other time. This fact is the basis for dating and correlating formations.

However, the problem is not a simple one. The recognition and time evaluation of contemporaneously deposited sediments and their faunas and floras of dissimilar composition is actually a very complex problem and is one that constantly challenges the ability of the stratigrapher, ecologist, and paleontologist. Correlations of widely separated sections on a lithologic, or even paleontologic basis, without adequate knowledge of lateral relationships and environmental control, may lead to erroneous stratigraphic and paleontologic conclusions. One has only to consider the many environs, each exhibiting their respective lithic and organic characteristics, which exist along our coast lines to gain a concept of the innumerable factors that have controlled the distribution, magnitude, and character of sedimentational and paleontologic realms in the past.

Many environments with their inhabitants may exist along the same time datum. For example, within a given shallow marine environment, sands may constitute the substratum and upon its surface certain habitants find optimum conditions of livelihood. Adjacent to this facies calcareous oozes and muds accumulate and foster the development of a totally different faunal and floral assemblage. At still another locale a coralline bottom may support organic types totally different from the first two facies. Yet all three environments possess the same time value. Similar conditions have existed throughout the geologic past.

Interpretation of Facies

Following the ever-present fundamental of geology that "the present furnishes a key to the past," it has been found that a study of the assemblages and structural adaptations of the individual members of the fauna found in different environments gives us a clue to the environmental conditions of the past. This, with a study of modern sedimentation, helps us to understand and evaluate formations deposited under various depositional facies, such as fresh, brackish and marine waters. Numerous such studies have been made in recent years and have been of great assistance to the petroleum geologist. Any geologist who worked in Southeastern New Mexico or West Texas 15 to 20 years ago knows the great confusion and difference of opinion that existed with regard to correlation until the various depositional facies were worked out and it was discovered that there was a line of reefs back of which were lagoonal and redbed deposition, while on the other side open sea conditions prevailed with entirely different types of deposits carrying very different asemblages of fossils.

Across Egypt there is a broad series of facies which have puzzled geologists. A similar condition prevails across Venezuela which has not yet been worked out. Interpretation of these and similar problems is essential to the petroleum industry and requires careful, detailed stratigraphic-paleontologic work.

Much of the confusion in correlation has been caused by the fact that geologists accustomed to marine deposits

AND ITS RELATION TO PETROLEUM GEOLOGY

Trilobite—genus Phacops; Devonian, Ohio. An important index fossil. (Specimen in Colorado School of Mines Museum.)

were baffled when they came in contact with brackish water and continental deposits. Fossils can give the information necessary to determine the equivalency and consequent correlation of sediments of varied compositions, characteristics and facies.

In a similar way, paleontology can help distinguish between lithologic units having similar lithology but which may be widely separated in age.

Use With Electrical Logs

Electrical logs show differences in character of various beds and formations. However, fundamentally they are based on resistivity, and actually they show differences in the permeability, amount of water present in the beds, and differences in the composition of that water. Variations in the composition or other characteristics of the beds themselves are indicated only to a very small extent.

Sometimes logs will show similar profiles for two different beds. In a well-established field where the sequence, character, and age of the beds is known from geologic and paleontologic data, there is little difficulty in correlating them; but in a wildcat operation the question immediately arises whether to interpret them as two different beds or as the same bed which has been repeated by faulting. To get the answer it is necessary to study the fossils.

Interpretation of Unconformities

Unconformities usually are a source of trouble to the geologist. Where they are angular or where there is a marked lithologic change, it usually is possible to recognize them easily; but where there is a disconformity with no angular discordance, they can be easily missed, especially if the beds above and below are of similar lithology. Unfortunately, unconformities of this type are common, especially in the Mississippian, Pennsylvanian, Permian, and Cretaceous systems. The fossil faunas may be the only definite proof of the stratigraphic break. In the northern Mississippi Valley, we now know of a number of such disconformities, some of which represent a considerable time interval, which were unrecognized through several generations of geological work and eventually were brought to light by paleontological evidence.

Geophysics

In applied geophysics, the procedure is essentially to obtain an instrumental record of variations in lithology which when mapped will indicate structure. However, the instruments themselves record only physical data. Geological and paleontological knowledge are needed to interpret the geophysical information, and the broader and more detailed the geological and paleontological knowledge is, the better are the results obtained.

In the past, much geophysical work has been valueless, or even misleading, because of poor or incorrect interpretation, resulting from a lack of geological and paleontological knowledge.

To cite an extreme case: Some years ago a geophysical crew was working in Wyoming endeavoring to map the Tertiary-Cretaceous unconformity. They reported very confused records, yet when I saw them they were set upon a fossiliferous outcrop which contained abundant characteristic Gretaceous fossils. However, the crew was composed of physicists and mathematicians who, knowing nothing paleontology, did not realize that they were below the objective for which they were searching. Fortunately, today most large companies appreciate the need of geological and paleontological data in geophysical work.

The Future

In the past petroleum geology has been interested primarily in a search for structures which might serve as traps for petroleum. At present in the U. S. most structures of this type are known and have been drilled. For future production we must depend largely on other types of traps, particularly stratigraphic traps. It is true that improved technical development will permit deeper drilling on proven structures and permit the exploration of deeply buried structures which are now known but are too deep for economic drilling at the present time. However, the number of these is quite limited.

To find stratigraphic traps will require careful field and laboratory studies to work out the various changes in lithology, facies, and cementation, and from them to prepare a detailed picture of the paleo-geography. This will require not only detailed geological work, but elaborate paleontologic studies on a scale which has hitherto seldom been attempted.

The valuable work being done by the Special Oil and Gas Investigations group of the U. S. Geological Survey is a step—but only a step—in this direction. The great demand for their maps and charts so far published is a direct indication of the need of such studies; but this is only a beginning. Well-illustrated texts, giving the details of the lithology and paleontology, should accompany the maps. In the future such studies will have to be enlarged to be regional in scope.

If the government, through the Geological Survey, desires to aid oil-finding intelligently, it will stop bothering about reports on small fields (where the included information usually is swabbed from the oil companies anyway, and which are published after the oil field is developed). Instead, it should embark on a series of broad, regional stratigraphic and paleontologic studies to be carried out in great detail. With such studies as a basis, the oil companies will have the data to work out the local problems for themselves in a competent and intelligent manner. Such broad regional studies are laborious, slow and very expensive, and will require geologists with broad training supported by a corps of paleontologists. However, these will be required to find the oil fields of the stratigraphic type, which will have to supply our future needs.

Part 7

(Conclusion)

Wells Not in Thermal Equilibrium

Temperature

By HUBERT GUYOD
Well Logging Consultant, Houston

WHILE setting, cement releases a considerable amount of heat. The resulting temperature increase can be used for determining the exact position of the cement behind a freshly cemented pipe.

CEMENT generates considerable heat while setting. Its position behind casing can therefore be determined by making temperature measurements in the mud column at the proper time. Figure 7-1 is an example from a well of Tepetate, La. The top of the cement is shown by a temperature increase from 10 to 20 degrees below 7200 feet.

The magnitude of the temperature anomaly measured at a given point of the mud column is a function of the following factors:

time
quantity of cement
nature of cement
bottom-hole pressure and temperature
size of casing
conditioning of well.

Influence of Time

The relatively high bottom-hole pressures exising in rotary holes accelerate the setting of the cement. Setting usually starts within a very short time (one to three hours, according to conditions) after the cement job is finished, and it is virtually completed a few hours later (perhaps five to 12 hours).

Referring to Figure 7-2, Z represents tentatively the time-temperature chart at one point of the cement after pumping stopped. Let T, T_0 and T_F represent the cement temperature at any time t, the initial cement temperature (time $t = a$) and the formation temperature, respectively. Until setting starts, T is approximately given by the following relation (see Part 5 of this series):

$$T = T_F - (T_F - T_0)e^{-\frac{2t}{d}}$$

d being the hole diameter. This gives arc AB of the graph.

When setting starts, the cement temperature increases steadily and may become higher than the formation temperature (arc BC). The maximum temperature T_M occurs perhaps at time t_M, shortly before setting is virtually completed. After that time less heat is generated within the cement than is transferred to the mud and formation, and the cement temperature gradually decreases until it reaches the formation temperature after several days (arc CD).

During the setting process the mud temperature T′ lags behind the cement temperature, and it is represented by arc ABC′D′ of curve Z′ whose maximum T'_M is less than T_M and occurs at at time t'_M greater than t_M. After that time, the mud temperature gradually reaches the cement temperature, i.e., the formation temperature.

The foregoing discussion is evidently oversimplified in that it neglects the influence of depth and the horizontal temperature gradient within the cement. Nevertheless, graph ABC′D′ is probably qualitatively correct, at least for the sections of the holes where there is an appreciable amount of cement, namely where large caves existed.

In sections which did not cave, the temperatures are less than shown by graphs Z and Z′ (less cement, therefore the heat generated by setting is dissipated faster), and the resulting graphs are perhaps as shown by Y and Y′. Y refers to the cement temperature and Y′ to the mud temperature.

In practice, graphs Y′ and Z′ give the limiting temperatures, and the actual temperatures would be given by points comprised between these two curves. The position of these points is controlled primarily by the degree of formation caving.

All the foregoing data should be used only qualitatively since they are somewhat hypothetical.

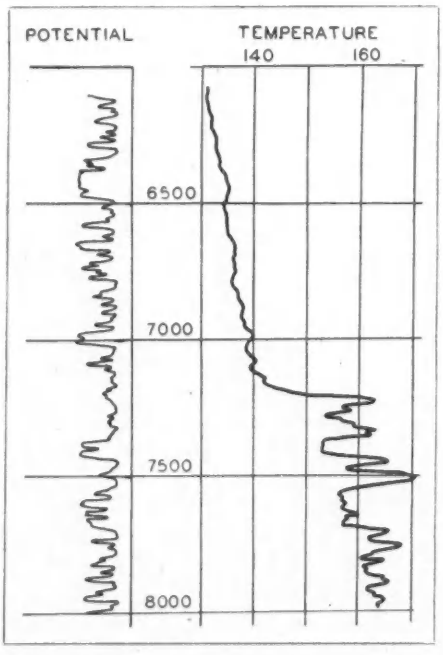


Figure 7-1. Potential graph and temperature graph in a freshly cemented well of Tepetate, South Louisiana.
After Deussen & Guyod, Courtesy AAPG.

Magnitude of Anomaly

Referring to Figure 7-3, E and F are the time-temperature graphs which would be obtained in the mud column if the hole were not cemented. E refers to sections which caved appreciably, while F refers to sections which did not (see Part 5 of this series). Graphs Z′ and Y′ discussed in the preceding section have been reproduced also on Figure 7-3 for convenience.

At any time after cementing, the temperature anomaly in a section which caved appreciably is measured by the vertical distance T_A between graphs Z′ and E, while the anomaly in a section which did not cave equals T'_A, distance between Y′ and F. Average anomalies, such as T''_A are comprised between these two values.

It is evident that if too much time elapses before the temperature measurements are taken (time t″, for example), the anomaly is of the same order of magnitude as those found where there is no cement. A temperature log made under such conditions will usually fail to indicate by inspection the sections which are cemented.

Quantity of Cement

If D_c and D_h represent the outside diameter of the casing and the diameter of the hole, respectively, the quantity of cement at any point is proportional to $(D_h - D_c)^2$. If D_c equals seven inches and if D_h varies from ten inches (bit size) to 15 inches (maximum caving), the volume of cement in certain sections is seven times greater than in others. However, the temperature anomalies are not in the same ratio. Generally, T_A is roughly twice as great as T'_A. The log of Figure 7-1 is typical in that respect. If there is extreme caving in certain sections of the hole (abnormal shales) the ratio may reach the value of 4. On the other hand, if the hole is reasonably uniform (little caving), the anomalies are small (T'_A) and the top of the cement is usually difficult to pick on the log, even if the measurements are taken early. In such cases it is almost imperative to have a caliper log or an electric log to interpret the temperature data, as will be explained later.

Miscellaneous Factors

Quick-setting cements give large temperature anomalies faster than other cements but these anomalies are of shorter duration. With slow-setting cements, very large anomalies are still observed as long as three days after the cement job is done, while temperatures of the same order are observed only

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Last of a series of seven articles, which are based upon research work sponsored by Halliburton Oil Well Cementing Company. Preceding installments have been published in The Oil Weekly of October 21 and 28, November 4 and 11, and December 2 and 9.

WELL LOGGING

within much shorter times with quick-setting cements, all other factors being approximately the same. Tentative time-temperature graphs for slow-setting cements are given on Figure 7-4 which shows that the temperature at points C and C′ is greater than for quick setting cement. This is due to the fact that the temperature of the cement before setting (points B and B′) was relatively high. Whether the cement itself is actually slow (or quick) setting, or the conditions (depth) are such that they slow down (or accelerate) the process, is immaterial. In either case the temperature anomalies are about the same.

If the size of the casing is large, the heat available from the cement has to warm a relatively great volume of mud. The resulting temperature increase is less than in casing of smaller diameter.

When mud or water is circulated in the hole—even for a very short time—after cementation part of, or all, the heat evolved by the cement is dissipated, and temperature measurements made subsequently may fail to exhibit significant anomalies.

Picking Cement Top

In most instances the cement top can be readily determined from a temperature log when the measurements are taken at the proper time. For example, in the case illustrated on Figure 7-3, it is obvious that from six to 24 hours after the cement job the temperature anomalies will be large enough to permit picking the top of the cement from the log. After that time the anomalies may be too small to allow making this determination by inspection.

There are cases when the graph does not exhibit any sharp break, even when the measurements are taken at the proper time. This happens, for example, in certain wells having penetrated shales which do not cave appreciably, and more particularly when the diameter of the casing is large with respect to the size of the bit: the quantity of cement behind the pipe is relatively small and resulting temperature anomalies may be of the same order of magnitude as those which are found in wells not cemented (see Part 5 of this series). Then, the cement top cannot be picked with certainty from the temperature graph. Fortunately, if other records are available, the problem can usually be solved. The most desirable record for doing so is a caliper log, and the information which it supplies is used as follows:

It has been seen that in a relatively deep hole (more than 2000 to 3000 feet) which is not cemented, the mud temperature is less in formations which cave than in those which do not. The opposite condition is found in holes which have been recently cemented. Therefore, by comparing the temperature and caliper logs, it is usually possi-

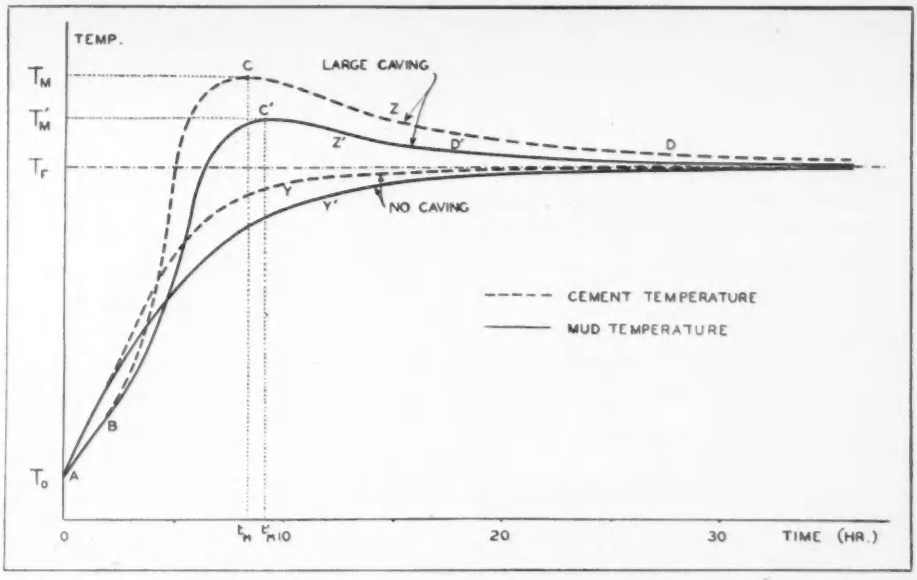


Figure 7-2. Hypothetical time-temperature graphs at a given level of a freshly cemented well (quick-setting cement).

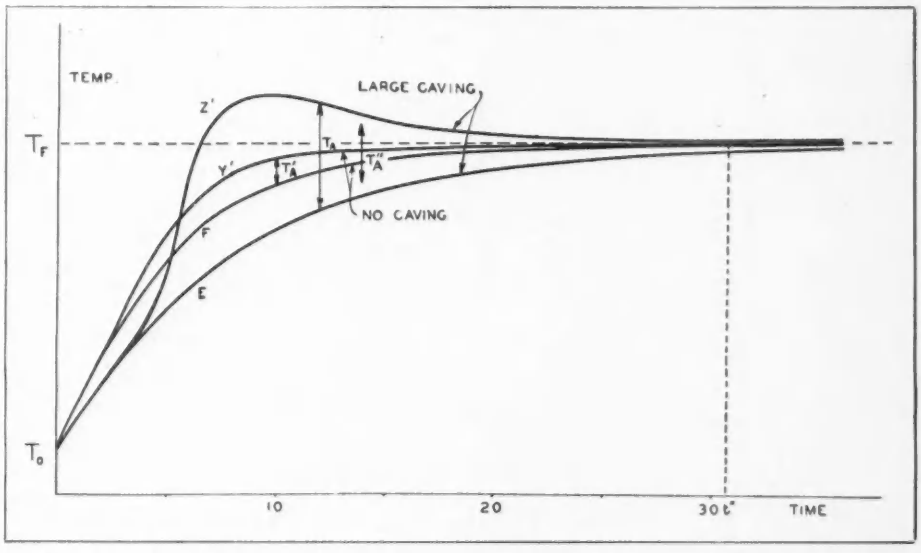


Figure 7-3. Graph for estimating temperature anomaly due to cement (partly hypothetical).

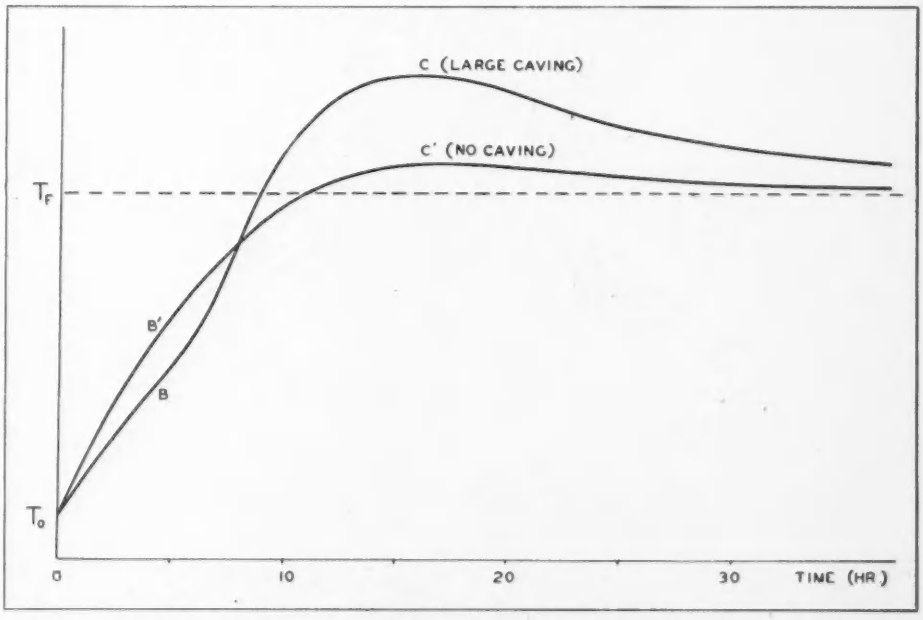


Figure 7-4. Hypothetical time-temperature graphs at a given level of a freshly cemented well (slow-setting cement).

ble to determine which sections contain cement. Referring, for example, to Figure 7-5, it can be seen that above 5800 feet the sections which caved are slightly colder than the others while the opposite holds true below 6000 feet. Therefore, the top of the cement is situated between 5800 and 6000 feet.

If no caliper log is available, good results are nevertheless obtained in most cases by using an electric log and assuming that shales cave more than sands. This assumption is usually correct except sometimes in very young formations (above the Eocene).

By tipping the temperature log of Figure 7-5 and sighting along the mean line it can be observed that there is a slight change of slope around 5980 feet. This may be associated to decreasing amounts of cement from 7000 to 5980 feet (some kind of tapered channelling). However, there is no evidence that this assumption is correct.

Tapered temperature logs are generally found in wells which have traversed formations caving only a little. Where shales cave appreciably the cement top is usually sharply defined, and the mean temperature line in cement is approximately parallel to the mean line in the non-cemented section of the hole (see Figure 7-1).

Squeeze Jobs

After cement is squeezed, it is usually necessary to wash the hole for a short time. If the washing is held to a minimum (20 minutes) little heat is dissipated by the mud stream and it is possible to locate the cement behind the pipe by temperature measurements. Figure 7-6 is an example of a successful job done under such conditions: the temperature data are substantiated by gamma-ray measurements shown in the center of the figure (carnotite was mixed with the cement). Run No. 1 was made before squeezing and Run No. 2 afterwards.

If circulation lasts a few hours, a large amount of the heat evolved is dissipated and it is usually impossible to locate the cement from the temperature graph, especially if setting was fast (deep holes).

Quality of Cement Job

A large increase of temperature in the mud column usually indicates a large volume of cement behind the pipe. The temperature graph, however, does not indicate how this cement is segregated. It may be all around the casing or it may be only on one side. In either case, the temperature recorded will be substantially the same. In short, the temperature log tells where there is cement behind the casing, but it does not tell whether the cement job is good or bad.

Cement Penetration

From the temperature logs available to the writer it seems that there is little cement penetration, if any, in permeable formations, except perhaps in fractured limestones for which no conclusive data could be obtained.

Conclusion

Temperature measurements for the location of cement should be made preferably from five hours to 24 hours after cementation if the cement sets fast, and somewhat later if setting is slow.

No circulation should be made in the hole between cementing and temperature logging. If it is imperative that the hole be washed, the circulation should be kept to a minimum; even so, the temperature log may fail to locate the cement.

Acknowledgments

An appreciable amount of the work described in this series of articles was suggested by numerous investigations conducted during the last two decades by C. E. Van Orstrand and associates, The API and many others. Some of the results obtained by these workers have been incorporated in these articles. Specific acknowledgment of the original work is difficult because the literature on temperature is extremely scattered. Nevertheless the writer wishes to emphasize that, without the basic information gathered from the work of the previous investigators, he would have been unable to understand fully the problem and to present adequately a summary of the subject.

The writer is also particularly grateful to Halliburton Oil Well Cementing Company for its financial help, without which most of this work would not have been possible.

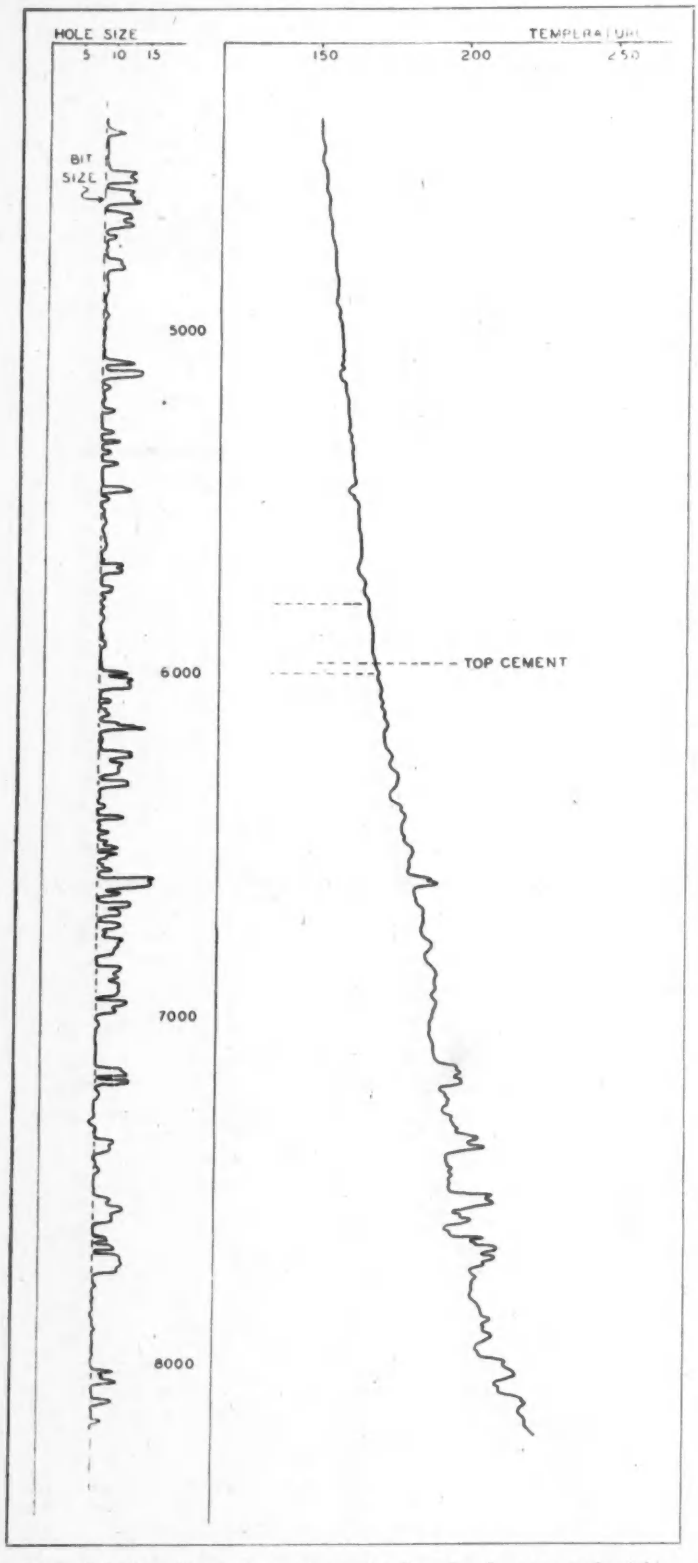


Figure 7-5. Use of temperature log and caliper log for accurately picking top of cement.

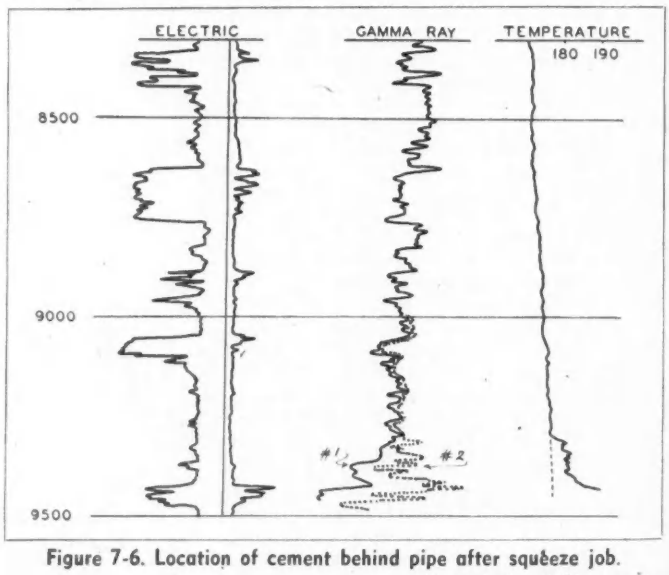


Figure 7-6. Location of cement behind pipe after squeeze job.
After Teplitz & Hassebrok.

FUNDAMENTALS OF INDUSTRIAL

Accident Prevention

By C. L. HIGHTOWER
Safety Director, United Gas Pipe Line Company
and Union Producing Company

THE accompanying material has been provided for foremen, department heads and others in preparing safety talks for presentation to employe groups.

Part 13-C

Material for Safety Talks

WINTER OPERATING PROBLEMS

Winter weather brings additional operating problems and precautions must be taken to safeguard against the hazards that exist when working in bad weather with rain, mud, low temperatures and reduced visibility to contend with. Some of these hazards are common to all operations, but special types of work sometimes bring about special or unusual hazards. In order to bring out all of these conditions and to emphasize the precautions that must be taken in each case, it is suggested that the conference method be followed in developing discussion on these problems. With this in mind, the following problems are given and subject headings listed so that they may be put on the blackboard and the group called on to name the hazards and outline the precautions to take in each instance.

Problem 1

What health hazards do the winter months bring and what can be done to guard against these hazards?

(Note to Chairman: List the following headings on the blackboard and call on the group to give their ideas and suggestions. Develop the list under the left side heading first. Write down each man's suggestion. Then proceed with the second column, developing a safe practice for each hazard listed on the other side. After both columns are filled, sum up the discussion and state the conclusions reached.)

Winter Health Hazards	Precautions to Take

Problem 2

What additional driving hazards exist in the winter months and how can we operate our cars and trucks to avoid accidents in bad weather?

(Note: Develop discussion in same manner as outlined under Problem 1.)

Winter Driving Hazards	Precautions to Take

Problem 3

What are the hazards resulting from using and handling tools and equipment in winter weather, and what can be done to overcome these hazards?

(Note: Develop discussion in same manner as Problems 1 and 2.)

Additional Hazards of Using and Handling Tools in Cold, Rainy Weather	Precautions to Take

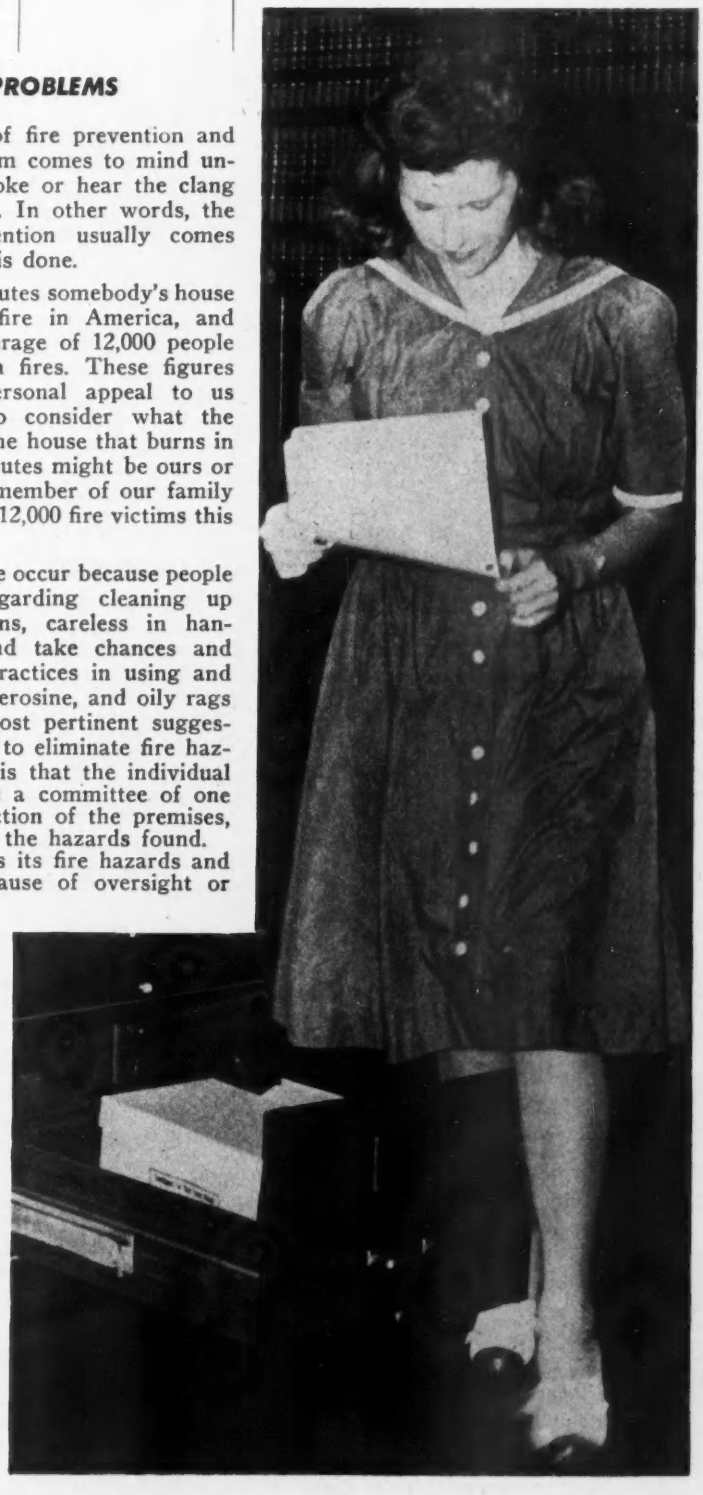
FIRE PROBLEMS

THE question of fire prevention and fire hazards seldom comes to mind unless we smell smoke or hear the clang of the fire engine. In other words, the thought of prevention usually comes after the damage is done.

Every three minutes somebody's house is destroyed by fire in America, and every year an average of 12,000 people lose their lives in fires. These figures make a more personal appeal to us when we stop to consider what the chances are that the house that burns in the next three minutes might be ours or that we or some member of our family may be one of the 12,000 fire victims this year.

Fires in the home occur because people are neglectful regarding cleaning up trash accumulations, careless in handling matches, and take chances and follow incorrect practices in using and storing gasoline, kerosine, and oily rags and mops. The most pertinent suggestion we can make to eliminate fire hazards in the home is that the individual appoint himself as a committee of one to make an inspection of the premises, locate and correct the hazards found.

The job also has its fire hazards and these develop because of oversight or



Many serious accidents occur from leaving file drawers open where workers can stumble over or bump into them.

neglect. Following are a few points to check in looking over the home or the job:

Fire Hazards in the Home

1. Accumulation of rubbish such as paper, rags, etc., in closets, attics and garages.
2. Exposed electric wiring and defective appliances.
3. Storage of gasoline and kerosine in the house or in open containers on the outside.
4. Use of gasoline for cleaning clothes, floors, etc.
5. Use of gasoline and kerosine for starting wood or coal fires.
6. Exposure of walls, floors, and other woodwork to open fire.
7. Loose matches in drawers, cabinets, or in cardboard boxes.
8. Smoking in bed.
9. Oily rags and mops in closets or other enclosed places.
10. Permitting children to play with matches.

Fire Hazards in the Plant

1. Smoking in prohibited areas.
2. Use of gasoline or kerosine in starting fires.
3. Servicing cars, trucks, or other gasoline motors with motor going.
4. Use of spark-making tools in gas or vapor areas.
5. Cutting or welding on vessels that have not been made completely gas-free or in areas where gas or vapor is present.
6. Defective electric wiring.
7. Using open lights in gas or vapor areas.
8. Accumulation of paper and other rubbish around offices, warehouses and plants.
9. Driving cars and trucks or installing gas engines in probable gas or vapor areas.
10. Use of low-pressure fittings, piping, and other equipment for high pressure service.
11. Permitting grass and weeds to grow around plant buildings and structures.

HEALTH TIPS FOR HOT WEATHER

Hot weather has a tendency to sap our strength. Our vitality is lowered and we are not only more susceptible to danger of heat prostration and infection, but also our minds are less active and there is an increased danger of accidents caused by doing the wrong thing.

Certain precautions can be followed in hot weather which will tend to lessen these typical summer hazards. Some of these are:

1. Eat moderately.
2. Do not drink water that is too cold and drink only a moderate amount.
3. Do not wear clothing that fits too tightly around face, neck and arms.
4. Get suntanned gradually. A serious burn is likely to result if you expose yourself for too long when you are first in the sun.
5. In extremely hot weather take time out for rest periods.
6. Take salt tablets.
7. Lean how to distinguish the difference between sunstroke and heat exhaustion, and the treatment for both.

Sunstroke

How to tell sunstroke:

1. Skin dry and hot to the touch.
2. Face red.
3. High fever.
4. Dizziness, raging headache with shooting pains in the head.
5. Breathing hard and loud.
6. May have convulsions.

What to do:

1. Remove to shady spot where it is cool.
2. Strip to the underclothes.
3. Lay on back—head and shoulders raised.
4. Put ice or cold wet cloths on the head.
5. Cool body with water or wet cloths. Avoid sudden shocks.
6. When conscious and able to drink, give person cold but not ice water.
7. No stimulants.
8. Call a doctor.

Heat Exhaustion

How to tell heat exhaustion:

1. Skin cold. Sweating profuse.
2. Face pale (sometimes purplish).
3. Chilly and often has cramps.
4. Dizziness, feeling of sickness, the person may vomit.
5. Usually acts dazed.
6. Sighs when breathing.
7. Partial or complete collapse.

What to do:

1. Remove to a quiet, cool place.
2. Loosen tight clothing.
3. Lay flat on back with head low.
4. Keep patient warm.
5. When conscious and able to drink give hot coffee or aromatic spirits of ammonia in water, but not ice water.
6. Call a doctor.

DANGERS OF ASPHYXIATION

In comparison to the total number of accidents, injuries resulting from exposure to natural gas are very infrequent in the gas industry.

There is an explanation for this. In the first place, we have learned that life cannot be sustained where gas is present in such quantity to displace the oxygen content of the air, and workmen usually refrain from going into closed places or gas areas without the protection of a fresh air hose mask. The use of an odorizing agent making it possible to readily detect the present of gas has also been helpful.

The fact that this type of injury is infrequent does not mean the hazard has been entirely eliminated. There still remain many opportunities for asphyxiation unless the dangers are recognized and precautions taken.

The chemist tells us that natural gas is made up principally of methane and ethane. There is no physiological effect from these gases except where they exist in sufficient quantity to cause oxygen deficiency.

Temporary exposure to a low mixture of the gas is not injurious and there can be no harmful effects of a permanent nature from inhaling natural gas. A man might safely walk around a break in a pipe line, on a derrick floor, or in a well-ventilated meter house where only a small quantity of natural gas is present for one or two hours without suffering any ill effects. Where such gas is present in high concentrations, however, either in confined places or in the open, it will soon decrease the oxygen content of air below 16.5, will cause distress, and below 7 percent will cause unconsciousness and death.

Dangerous points:

1. Inside closed buildings as pump rooms, compressor rooms, etc.
2. In manholes.
3. Bellholes.
4. Inside oil or gasoline tanks and tank cars.
5. In low places in the open.

Precautions to take:

1. Keep buildings well ventilated.
2. Do not go inside buildings where gas is present unless absolutely necessary, and then use protective equipment.
3. Dig large bellholes.
4. Use a fresh-air hose mask in going in gas area, tanks, or rooms where gas is present.
5. Put on a life line and station someone in the open to work blower and to help you out if anything goes wrong.
6. Do not depend on canister type mask for protection. Since there is an oxygen deficiency, the only protection is to supply uncontaminated air from an outside source.
7. In working around a break in a line or under similar conditions in the open workmen should alternate so that one man will not be exposed for too long a period.

Remember, natural gas is not dangerous when treated with respect and the proper precautions are taken. It is necessary to be prepared, however, for the unexpected break or other unusual condition, and taking unnecessary chances may result fatally.

Should a fellow employe be overcome, rescue him, but do so without unnecessarily exposing yourself. There might be two men out instead of one. There is one case on record where seven men were overcome in the same tank. Five were sent in without the protection of a gas mask to get the first two who were working in the vessel. Be sure the man you work with knows how to give artificial respiration. Your own knowledge of first aid will be of no avail if you are the victim.

WINTER DRIVING

At this time of year we should carefully consider problems of winter driving. Each winter there are many traffic accidents that result in fatalities. Most of these accidents could have been prevented if the drivers of the cars concerned had given sufficient thought to the increased hazards common to this season of the year.

Probably most of us consider ourselves good drivers and perhaps we have never been involved in a traffic accident, but this is not positive assurance that we are good drivers. Perhaps we have just been lucky.

We may be good on the straight, dry stretches of highway but how good are we when the snow, sleet and ice covers the roads and streets? Have we decreased our speed to conform with the increased driving hazards? Have we made sure that our tires are in good condition and well treaded to take care of the ever-present danger of skidding? Are we still remembering that our brakes can become a liability instead of an asset when we are trying to stop on a slippery street? Are we more alert? If we haven't considered all these things, then we aren't good drivers.

Let us heed the following suggestions and become good winter drivers:

1. When your car skids, take your foot

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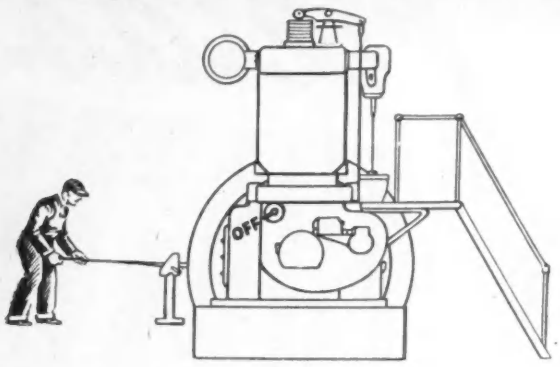
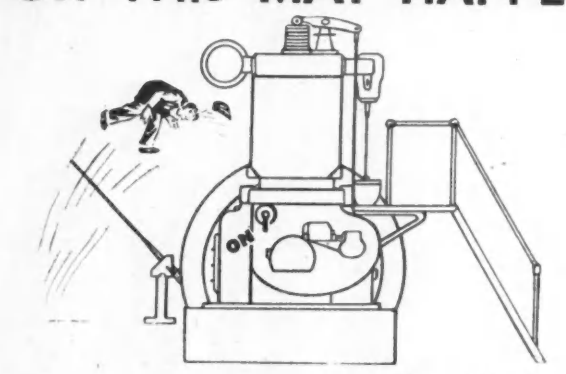
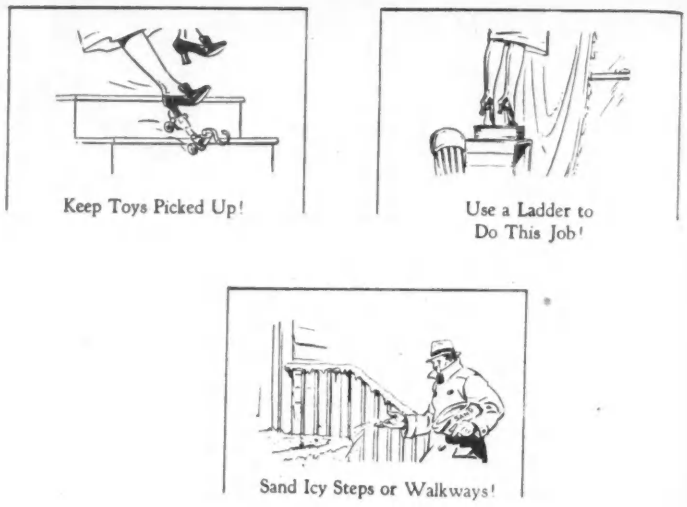





BEWARE OF FALLS!
Keep Toys Picked Up!
Use a Ladder to Do This Job!
Sand Icy Steps or Walkways!
Wipe Up Spilled Oil!
This Is Dangerous! Don't Use!

Posters like these are constant safety reminders

off the accelerator and as your motor slows its speed turn your steering wheel in the direction that the rear of the car is sliding. Keep your foot off the brake and do not release the clutch. This will usually bring a car out of the worst skid.

2. To stop your car on slippery surfaces, start slowing down a considerable distance from where you want to stop. At first press your brake lightly and release at once, then press it again and release quickly, and repeat. By using this method of applying your brakes continuously, the car or truck will usually come to a smooth stop instead of going into a skid.

3. While driving in traffic over winter streets and roads, anticipate the movements of the cars in front of you and the changes in traffic signals, etc.

4. Before descending steep or slippery grades, shift into second or low gear.

5. Make sure the windshield wiper operates effectively.

6. Sleet on the windshield may be avoided by wiping the glass with glycerine, and by raising or blocking up the rear end of the hood to let the engine heat help melt the ice.

7. In heavy mist or fog use the headlights with depressed beam. The upper beam or spotlight will glare back at you.

8. In night driving wipe the mud or snow from the headlights frequently. Also, clean the entire windshield often.

9. Keep out of ruts in mud, snow and frozen ground. Beware of soft shoulders. If you run off the pavement, slow down and turn back with great care to avoid a skid or lurch into another traffic lane.

10. Spinning the rear wheels only digs deeper into mud or snow. Rock the car forward and back a few inches repeatedly until you can pull or back out.

DRIVING ON STRANGE ROADS

The readiness with which our present-day cars develop high speeds and the riding comfort afforded at such speeds is an open invitation to the average driver to "step on it," regardless of whether he knows the road on which he is driving. There are no figures available as to the number of accidents which might be attributed to the driver's lack of knowledge of road conditions, but unquestionably such accidents are numerous.

One instance which resulted from driving too fast on a road with which the driver and the other passengers were unfamiliar, resulted in the death of two people and the serious injury of the third. The accident occurred at about 10:30 p.m. on a dark night, and when the car was driving at an estimated speed of 70 miles per hour. When the car approached the "dead end" intersection where the road on which they were driving entered a lateral highway, the driver, due to the speed and his unfamiliarity with the road, was unable to make the right vertical turn or to stop. As a result, the car went entirely across the lateral highway, jumped the drainage ditch on the other side, crashed through a sign, and struck a telephone pole.

In driving on a strange highway, the driver should observe the following precautions:

1. Drive at least ten to 15 miles slower than he normally does on a highway with which he is familiar. This would indicate a speed of about 40 miles per hour for safety.

2. Stay on the right side of the highway.

3. Observe all highway signs and markers. When a sign gives a slow warning, slow down and watch out for narrow bridges.

These are precautions that should be observed on driving on any highway, but they are particularly necessary when traveling on a strange road.

ACCIDENTS ON THE STRAIGHTAWAY

The sight of a long, smooth straight stretch of highway gives everyone the urge to bear a little harder on the accelerator and let the old bus run to see how much she will do. The false security of the straightaway accounted for 78.7 percent of the automobile deaths last year.

Here are a few things that are overlooked:

1. The danger of cars approaching from cross roads.

2. The fact that the hum of the motor tends to make you sleepy.

3. The possibility of a blowout or the mechanical failure of the car.

4. The possibility of a wet or oily spot on the pavement.

If we realize the above dangers, we can appreciate the fact that there are few preventive measures we can take.

1. Observe the speed laws and highway markers.

2. Keep your car in good mechanical condition by frequent inspections.

3. Observe the courtesies of the highway.

IMPORTANT PHASES OF

Contract Drilling Accounting

By LELAND BRECKENRIDGE

American Association of Oilwell Drilling Contractors

THE accounting program which the American Association of Oilwell Drilling Contractors is attempting to carry out in the drilling business is designed to keep drilling contractors from losing money through lack of information about their operations. It is not an attempt to establish uniform costs or to fix contract prices. It does not seek to determine the cost of any contractor's work but it is very much interested in helping him to know his own costs. The only suggestion as to price is that it should be at least a reasonable amount above the total direct and indirect cost of the work done. Instead of removing competition between drilling contractors, the association hopes to make it more intelligent.

By emphasizing the positive value of sound accounting procedure, we are trying to secure for the accounting department the important place in the drilling industry which it deserves, if it functions properly. We are trying to impress upon the contractor that his accountant is not just an evil forced upon him by the revenue laws, a dead expense to be ignored except at tax time, but that he is, or can be, just as much a part of the money-making machinery as the tool pusher, provided he is given an opportunity.

The first reaction of the average accountant when he examines our suggested well cost extension is "Why, it's about the same as the distribution I am using now, except for a difference in arrangement." That is quite true and not a result of pure coincidence. Any contractor who uses drilling equipment to dig a hole in search of oil is going to encounter substantially the same types and kinds of expense as any other contractor engaged in a similar operation. He will spend money for labor, supervision, supplies, repairs, bits, trucking, pits, mud, and so forth. So, quite naturally, when we come to make a list of the items of expense the names used are going to be largely the same. About the only difference is, usually, a difference in arrangement, but we think this difference can be important. The normal reaction and the normal practice are to list the items of well cost in the order of their obviousness. Labor comes first almost always, followed, perhaps, by trucking and bits. Then, mixed in with mud, pits, derrick and cement, come the supply and repair expense items necessary to operate the rig.

In developing a suggested extension of well costs, we have had to keep in mind that contract drilling firms range in size of operation from one rig to 50 or more, and in office personnel from one all-purpose clerk, or part-time bookkeeper, to a large and competent staff headed by certified men. With that picture before us we have tried to so arrange our cost accounts so that a one-rig contractor without expert office help can accumulate his well costs under a few broad classifications, and have the same basic cost information on his work as a contractor with more extensive operations, skilled office help, and a more extended cost distribution. He may not know as much about the detail of his cost. If supplies, or upkeep, or other operating charges run high on a particular rig or job he will not know without further research just what is causing the trouble, but he will have the total cost in the proper general classifications.

With this need in mind we have suggested three degrees of well cost extension. Not with the idea that these divisions are the only ones possible, or that they are inflexible, but in order that there might be comparative uniformity in the well cost accounts of drilling contractors, regardless of the extent of their operations. Our first step was to break down the cost of drilling a well into seven general classifications, which we have called Major Factors. We believe that all of the costs of drilling can, and should, be written into one of them. These primary divisions are:

1. Labor and supervision
2. Supplies
3. Maintenance and repair
4. Ordinary operating expenses
5. Other operating charges
6. Depreciation
7. Overhead.

Then, by logical and consistent development of these Major Factors, we have illustrated how more detailed operating information may be accumulated, its extent depending on the requirements of management and size of office staff.

Working With Experience Averages

Accounting for contract drilling cost requires accuracy plus speed. There is not time between the completion of one job and the starting of another to make a complete compilation of all of the costs on the first job. These costs may not all be in for 30 or 60 days, and by that time another contract may be well along toward completion. The drilling contractor is not in position to wait so long to find out what the work costs him. He must know before he takes a job what it is going to cost him within narrow limits, unless he has a cushion of cost-plus to fall back upon. Such advance information may be gained in part from past experience, and we have tried to so arrange our cost accounts that they will provide it through the developing of proven averages.

In brief, we are attempting to apply to the business of contract drilling the principles of true cost accounting. Cost accounting is not just tabulating and classifying results after the incidents leading up to these results have happened. That is bookkeeping. Cost accounting involves projecting past experience out into future work, and then proving or disproving the estimate by actual figures.

In the accompanying chart it will be observed that we have tried to accumulate under the first three Major Factors those expenses which are incident to the usual operation of a rig. Expenses like labor, supervision, and the supplies and repairs needed to keep the table turning. Expenses which are not too much affected by distances or formations; expenses, in short, which may be reduced to a dependable average figure for a usual operating day, for an identifiable drilling rig. By dividing the total of the expense of operating a given rig over a period of time or a series of contracts by the number of rig operating days in which it was incurred, a highly important daily average cost factor may be developed which may be used in estimating the cost of future work. Armed with this figure for each of his rigs, the contractor can fix his attention on the number of days required to do the job, and thereby eliminate much of the guesswork in bidding. To this figure, obtained by multiplying the daily operating expense factor for the rig to be used by the estimated number of days required to do the work, must be added the cost of variable expenses such as trucking, bits, mud, pits and dirt work, derrick, etc., and the indirect expenses of overhead and depreciation on the rig and drill pipe. After adding an amount for the expected profit the estimate is ready to submit. In our business we cannot afford to lose sight of the ominous fact that our profit or loss on a drilling contract is largely determined while the proposed well is still represented by a stake driven in the ground.

The use of average expense factors in estimating the cost of proposed work has the further recommendation that it accounts automatically for a normal amount of idle time, because all expenses are prorated to work actually done.

These averages have other uses also. Immediately upon completion of a job, an amazingly close estimate of its cost may be had by substituting actual days for estimated days and multiplying by the factor. If the factor is $600 per day, and the job requires ten days longer than was estimated, it is immediately apparent that expected profit has been reduced by $6000. Needless to say, current completions must be checked against the average in order that a trend upward or downward may be detected. Variation from the factor on one contract does not disturb the contractor or indicate that the factor is wrong, because some unusual repair or replacement expense may have been incurred on the

Well Cost Extension Chart

Contract Drilling Expense—Rotary—90-11

Condensed Accounts	Sub-Accounts	Further Sub-Divisions
1. Labor & Supervision	11 Labor 12 Supervision 13 W.C. & P.L. Insurance	131 W.C. Insurance 132 P.L. Insurance
	14 Crew Transportation 15 S. S. Taxes 16 Auto Expense—Direct	
2. Supplies	21 Rig Supplies 22 Hand Tools 23 Valves, Fittings & Line Pipe 24 Oils and Greases 25 Fire & Other Insurance 26 Property Taxes	
3. Maintenance & Repairs	31 Drawworks—Repairs & Parts 32 Pumps—Repairs & Parts 33 Power & Transmissions—Repairs & Parts	331 Engine, Gen. & Motor 332 Boiler Plants 333 Transmissions and Chains
	34 Overhead String—Repairs & Parts	341 Blocks, Hooks, etc. 342 Swivel 343 Wire Line 344 Rotary Hose
	35 Other Equipment—Repairs & Parts	351 Rotary 352 Electrical Equipment 353 B.O.P. etc. 354 Operation Instruments
	36 General Maintenance Expense	361 Other Shop & Weld. Expense 362 Gen. Maint. Exp. 363 Trans. of Supplies
	37 Fishing, Repairs, Parts, Rentals 39 Drilling String—Repairs & Parts	391 Drill Pipe—Repairs & Parts 392 Kellys, Collars, etc. Repairs & Parts
4. Ordinary Operating Expense	41 Bits & Reamers 42 Transportation & Rigging In & Out	421 Trucking—In & Out 422 Other Trans.—In & Out 423 Winch Work and Spotting
5. Other Operating Charges	51 Location & Preparatory Charges	511 Pits & Dirt Work 512 Derrick, Rental, Erection, etc. 513 Lumber 514 Roads, Bridges, Clearings
	52 Fuel	521 Fuel 522 Fuel Lines 523 Fuel Stg. & Trans.
	53 Water	531 Water 532 Water Lines 533 Water Stg. & Trans.
	54 Mud & Chemicals 55 Coreheads & Coring 56 Well Equipment	561 Casing & Tubing 562 Heads & Shoes 563 Cementing & Cement
	58 Special Services 59 Special Materials	564 Tanks & Separators
6. Depreciation	81 Rig Depreciation 82 Drill Pipe Depreciation	
7. Overhead	91 General Overhead 92 Administration Expense	

Well Cost Estimate

Made To:_____ Date_____
For: Well Name and No._____ County_____ State_____
T.D._____ LOCATION BY SURVEY_____
Contemplate using Rig. No._____ Estimated Operating Days_____

	Estimated Cost	Actual Cost
Rig Operating_____ days at $_____ per day	$_____	
Drilling String Maintenance_____ days at $_____ per day		
Bits and Reamers		
No._____ Size_____ @ Ea.	$_____	
No._____ Size_____ @ Ea.	$_____	
No._____ Size_____ @ Ea.	$_____	
No._____ Size_____ @ Ea.	$_____	
Trucking and Transportation	$_____	
Total Direct Expense—Normal Contract	$_____	
Extras:		
Pits and Dirt Work	$_____	
Derrick, Rental, Erection, etc.	$_____	
Fuel	$_____	
Fuel Lines	$_____	
Water	$_____	
Water Lines	$_____	
Mud and Chemicals	$_____	
Coreheads and Coring	$_____	
Roads, Bridges, & Clearing	$_____	
Casing and Tubing	$_____	
Heads and Shoes	$_____	
Halliburton and Cement	$_____	
Perforating	$_____	
Acidizing	$_____	
Electric Logging	$_____	
Total Extras	$_____	
Rig Depreciation_____ days @ $_____ per day	$_____	
Drill Pipe Depreciation	$_____	
Overhead_____ days at $_____ per day	$_____	
Total Cost	$_____	
Total Cost	$_____	
No. of days	_____	Cost per day $_____
Total Cost	$_____	
No. of feet	_____	Cost per foot $_____
Total Cost	$_____	
Plus Profit_____ days at	$_____	
Total Cost and Profit	$_____	
Total Cost and Profit	$_____	
No. of Days_____		Price per day $_____
Total Cost and Profit	$_____	
No. of Feet		Price per foot $_____

job. A trend in either direction, however, may indicate that the factor requires adjustment.

There arises here the question of how to treat minor replacements which are properly expense items, but which have a normal useful life of more than one contract, such as wire lines and rotary hose. The accounting decision is whether they should be charged directly to a job, or impounded in a clearance account and prorated to work done on the basis of active use days. The latter procedure is probably more correct technically, but when working with averages we can see no great objection to making the charge directly to the job in progress. If the period included in the average covers a sufficient spread of time or jobs to make it dependable, then such items of expense will be included either way, and the practice of charging direct to the job is simpler.

Major overhaul expense, which is usually incurred while a rig is idle, should be distributed back to the work period during which the wear was caused, on the basis of active rig days, otherwise there will be a disproportion between the daily average operating expense for the early life of a rig and its later use, which is not reflective of true conditions. While it is obviously true that new equipment is cheaper to operate, it must not be overlooked that wear is occurring which must be repaired later. The elapsed period between major overhauls will be the basis of spreading back such expenses.

Thus far we have been dealing with the expenses accumulated under the first three Major Factors. Those incident to the normal operation of the drilling machinery on location and reducible to dependable averages.

Variable Expenses

In the four and five divisions we have grouped those costs which are incurred in the drilling of a usual contract well, but which vary in amount with distances, nature of the formation penetrated, and with contract provisions. Bits, trucking, derrick, dirt work, fuel, water, mud and special services or materials are some of these. Because they are affected by drilling conditions they are not properly reducible to dependable daily average figures for bidding purposes except, of course, for work in the same or a similar area. On each new job which involves a change in drilling conditions and a move to an unfamiliar area, they must be estimated anew in the light of distances, formation to be penetrated, and provisions of the drilling agreement.

Indirect Expenses

The last two Major Factors, numbered six and seven, are for the indirect, but important costs of depreciation and overhead, which may be neither overlooked nor minimized if operations are to be profitable. These expenses, we suggest, should be charged into operations currently, on the basis of daily factors developed from past experience. Overhead usually varies little from one year to the next, hence a factor based on the preceding year will ordinarily be satisfactory.

Depreciation

Depreciation is such a large monetary factor in the cost of drilling that it should be treated with proper emphasis and its relation to successful operations clearly understood.

So far we have been dealing principally with direct costs, and our problem there is easier. When funds are actually withdrawn from the bank to pay an item of expense, that item is a bit hard to overlook, or even to minimize. But when it comes to feeding back into operations investment money spent, or promised, some months or years ago the proper allocation is not so easy, even when approached conscientiously, as sometimes it is not.

Since time, actual rig operating time, is the essence of the drilling business, we have concluded that the most equitable way to charge wear-out expense on our equipment into our work is on the basis of the use of the equipment. For this purpose we suggest estimating the useful life of equipment in terms of operating

days rather than calendar years, and feeding depreciation expense into current work on the basis of the number of such time units required for completion. Here, as elsewhere in this discussion, by an active day or a rig operating day, is meant a full crew day; a 24-hour period in which the equipment is manned by a full crew.

This Use Time Method is not represented as the perfect answer to all depreciation problems, but we think it comes nearer than any other of the well-known methods to a recovery of investment through actual use. It has some of the good features of the Diminishing Rate Method in that equipment will be kept busier during the earlier years of its life, so that the period of greatest use bears a proportionate part of the wear-out expense. Conversely, job costs in periods of reduced activity will not be overloaded, as is the case when each year bears the same amount of depreciation expense, irrespective of the amount of work done.

We have suggested 1095 days as being a fair estimate of the actual operating life of a rotary rig, as a unit. This is the equivalent in days of three calendar years. It does not mean, however, that, if this use method is employed, a rig will be fully depreciated in three years, because, unfortunately, our equipment cannot be kept that busy. Under normal conditions, if investment were not increased by replacement of major elements of the rig, some five years or more would be required to absorb cost into operations. In actual practice, of course, capital replacements will be made to any rig which is kept sufficiently busy to use up any considerable portion of the 1095 days in that span of time. Each such addition further lengthens the period of time required to depreciate the rig fully. This does not mean, of course, that after 1095 days of use a drilling rig could not be patched up so that it would still make hole, but there is a vast difference between being able to make hole and being able to make hole competitively. This difference has retired many a contractor with obsolete equipment. The ever-present specter of obsolescence, caused by radical changes in equipment design to meet new depth or formation requirements, must not be disregarded in the depreciation allowance of any drilling contractor who expects to remain one.

Perhaps the finest refinement in depreciation practice is the Unit Use Method, in which each unit of the rig is given a life estimate in terms of operating days, and depreciated on that basis. This method, while admittedly more accurate, has the drawback of being considerably more complicated, and slower in application to individual well costs.

On the subject of depreciation the contractor has always to consider the terrific impact of the taxing authorities. Probably a considerable majority are committed to a straight line time method of computing depreciation for tax purposes, and the Commissioner is slow to approve a change to a use method on old tools. On new equipment, however, approval of the operating day use method is not so difficult to obtain.

We have tried, in our suggested practices, to keep from being influenced unduly by tax accounting where we considered a distortion would result, and this, we think, is eminently true in depreciation practices. We have observed little evidence on the part of the Bureau

DAY WORK RATE SCHEDULE

PROPOSAL TO ..... DATE .....

WELL NAME ..... NO. ..... COUNTY ..... STATE .....

SURVEY ..... DISTRICT ..... TOTAL DEPTH .....

DEPTH	0 5000	5000 6000	6000 7000	7000 8000	8000 9000	9000 10000	10000 11000	11000 12000	12000 13000	13000 14000	14000 15000
Oper. Cost of Rig											
Depn.											
Overhead											
Derrick											
Fuel											
Water											
Total											
Profit											
Rate W/O D.P.											
D.P. Rental											
Profit											
Rate with D.P.											

STANDBY CHARGES		REMARKS
Labor		
Supervision		
Comp. Ins.		
SSA		
Other Ins.		
Supt. Car Exp.		
Depn.		
Overhead		
Derrick		
Fuel		
Water		
TOTAL		

to develop a sound and dependable depreciation policy on either drilling or producing equipment. Many accountants, therefore, are employing the use method of charging depreciation to contract costs, even though they are bound to another method for tax purposes. This is effected by accruing the charge to current work, with a credit to a Reserve for Depreciation Estimate account. At the close of the accounting period the difference between the amounts credited to this account and the actual tax figure is cleared to profit and loss, or back through the job costs. Since we think our suggested practice more nearly approximates actual conditions than the straight line time method, we suggest the former procedure.

Drill Pipe Depreciation

What has been said thus far on the subject of depreciation applies to the drilling rig, exclusive of the drilling string. Since repair and upkeep on the rig proper are charged directly to expense, the rig depreciation figure is not affected so radically by the nature of the formation penetrated as is that used for drill pipe. Because of this direct effect of drilling conditions, no over-all depreciation rates can be suggested for the drilling string. What, in certain areas, amounts almost to an expendable supply is, in other areas, a true capital asset. In each area, therefore, drill pipe cost must be charged to operations at a rate established by experience in that particular field.

There are several methods of drill pipe depreciation in use, each considered satisfactory by the user. Some accountants use an inventory basis, in which the pipe is given an appraised value at the end of each job, if it lasts through a full contract, and the difference between the beginning and ending values is charged to the job. Others charge drill pipe wear to current contracts on the basis of so much per foot per day for each size of pipe in use and still others simplify this latter practice by making a flat charge per day of use, as is done with the rig. These two last-named methods obviously presuppose an experience figure derived from past operations in the same or a similar area.

As supporting evidence for any method

■ CONTINUED ON PAGE 57

FEASIBILITY AND POSSIBILITY OF

Statewide Gas Proration and Ratable Take

By JACK K. BAUMEL

Chief Engineer of the Railroad Commission of Texas and Member of the Research and Coordinating Committee of the Interstate Commerce Commission

CONSERVATION, in its larger sense, has been defined as a "wiser and more efficient utilization of our natural resources." The conservation of oil and gas not only implies a better utilization of these substances after they have been produced, but deals with those engineering principles which will result in a greater ultimate recovery from the reservoirs of the present producing fields, as well as those yet to be discovered.

Our reserves of natural gas, although apparently abundant at present, are limited and irreplaceable; and any production method which tends to bring about waste of these reserves is contrary to the public interest.

The economic necessity for the conservation of these natural gas reserves lies in the importance of preventing preventable waste of this limited and exhaustible natural resource, which exploitation can perchance be subject to the effects of selfish and short-sighted operations. The interests of the oil and gas producing states and the public consist in conserving gas for beneficial uses for which it is adopted and in conserving the gas energy in reservoirs as a medium of increasing oil production. The economics of natural gas and oil are intermingled further in such uses of natural gas as the operation of natural gasoline plants, repressuring and recycling plants, and fuel for exploration, production, and refining of oil. Any form of conservation, therefore, as applied to natural gas, affects both the gas industry and the oil industry.

Any form of conservation and proration must give careful consideration to the rights and interests of land owners, lease owners, well owners, oil and gas producers, pipe lines, and public interest. Practical operating conditions arising out of the occurrence of natural gas with oil, the feasibility and necessity of producing the two together, and the necessity and desirability of conserving the gas energy under pressure in the reservoir must be weighted against the feasibility of such conservation by returning gas to a reservoir when the gas cannot be sold for industrial or any other legal use.

Proration Problems

Legislation has enabled some of the oil- and gas-producing states to end some of the intolerable and profligate waste of natural gas which was formerly taking place. The more obvious forms of waste such as the blowing of wells completed high on top of a structure in the hope of causing them to produce oil, wells being produced with inefficient gas-oil ratios, the completion of wells in such manner as to permit the escape of gas from a gas-producing horizon overlying an oil-producing horizon to other porous strata, and many others, consequently, have been eradicated in many states, but the efforts toward gas proration, which are designed to curtail subtle types of waste occurring within reservoirs through the premature encroachment and coning of water, have thus far met with substantial reverses.

The information and knowledge obtained from the establishment of oil proration have not proved of much assistance in the proration of gas because of the inherent differences between oil and gas. Devices which are expedient in the proration of oil do not necessarily apply in the proration of gas; and, therefore, it has been necessary to start from the beginning.

When the state prorates gas from a gas reservoir or from a gas cap overlying an oil zone in the interest of conservation, the orders doing so must be fair and reasonable and protect correlative rights of the owners of the pool. A formula for the allocation of production within a field must meet two basic requirements: First, it must prevent waste; and, second, it must distribute the allowable ratably among the wells in such a manner that each owner will have the opportunity of obtaining his fair share of the production.

To obtain the aims of a proper allocation program, the following principles should be applied:

1. The allowable assigned to a well or tract should depend, in part, upon its current average ability to produce.

2. The allowable of a well or tract should depend, in part, upon the proportion its productive acreage bears to the total productive acreage of the field as a whole. The amount of acreage to be assigned to the well for allocation purposes to depend upon the spacing pattern and proration unit assigned for the particular field.

The factors involved in any proration program include potentials, acreage, deliverability, rock-pressure, reservoir pressure, and volumetric withdrawal. It is believed, therefore, that proper factors can be chosen which, in proper combination, will furnish a sound allocation formula. It is the opinion of the writer that no single factor can be used in allocating allowables within pools because no single factor can prevent waste and give equity; each pool must be considered upon the facts found therein. The most important factor in any gas proration formula is acreage. More weight should be given to it than any other factor in order to minimize drainage across property lines and to discourage unnecessary drilling. The potential factor is widely used in allocating gas production in many states. This factor is subject to considerable misuse and many engineers have condemned the potential factor as being inaccurate and wasteful. Another important factor which should be used in a gas proration formula, as a corrective factor, is reservoir pressure. This factor should be used in conjunction with the acreage factor, since it does bear some relation to structural position and some relation to the degree of depeletion of a tract. This factor will also attempt to adjust the allowables in a way as to reduce the effects of non-ratable withdrawals.

It is a well known fact that conservation requires restriction of production. Restriction of production brings about the problem of allocating the restricted production among the fields and then allocating the allowable ratably among the producers in the field. The question of statewide gas proration is a new problem that will require a great deal of study as to the feasibility of such a venture, and as to what good can be accomplished in the way of preventing waste.

Proration Technique

The technique for statewide gas proration, when feasible, should follow substantially the same plan adopted for oil proration. The plan adopted for oil, as in Texas, involves statewide production control. In Texas, to prevent excessive and wasteful storage and losses from evaporation and leakage, the total production from the state is limited, after notice and public hearing, to a figure found by the Commission to be an amount needed for the ensuing month based upon reasonable market demand. This amount, or the total state allowable, is then divided among the fields, based upon efficient rates, in order that each field may have its fair share of the total state allowable, then the field's allowable is prorated to the wells, based upon the field's allocation formula. The orders or regulations of the Commission have the effect of preventing waste, thereby increasing the ultimate recovery of oil and gas from the fields of the state; and, at the same time, giving to each operator the opportunity to produce his fair share of the oi land gas in the field.

The reasons for limiting the production of oil to a statewide production control cannot in all cases be applied to gas proration. Its fugacious characteristics are such that wasteful storage, losses from evaporation, and leakage due

This paper was presented at a meeting of the Interstate Compact Commission, December 9-11, 1946.

to above-ground storage, do not apply to gas. The market for gas is limited by the capacities of the lines, seasonable peak loads, and consumers' demand at the end of the line.

A gas company will only lay a line to a field if it can be assured of an adequate reserve over a period of years, while an oil purchaser will, many times, lay a line to a field having only one or two wells. Then, too, there are the interstate and intrastate features of the gas business and the fact that part of the interests involved are subject to general public utility regulation and the Federal Natural Gas Act, while other parts are conducted as unregulated competitive ventures.

As a whole, the problem of statewide gas proration is somewhat different from the problem of statewide oil proration. It has been argued that gas pipe lines are not common carriers in the same sense as oil pipe lines. However, the Texas Legislature has declared a person operating a gas pipe line to be in the business of a public utility and in a business involving public interest. From a practical standpoint and under proper factual conditions which are reasonable and economically feasible, the legal fact that a gas line is a public utility and a common purchaser, if not a common carrier, would permit distribution of markets as between fields. As an example of what is meant by the above and specifically applying it to Texas, it can easily be seen that it would be economically non-feasible and impractical to take the market demand of the Panhandle field in Texas plus the market demand of the Carthage field in Texas and allocate the total demand from the two fields as between the fields on any basis other than the demand from each separate field. This for the reason that geographically the fields are located very far apart, and for the further reason that the pressures in the fields are at a wide variance. On the other hand, where a gas pipe line is reasonably accessible to a field other than that from which it is originally connected and the gas from the other fields can be delivered at the approximate pressure at which the line is equipped to take, no reason is seen why a regulatory body under proper authority from their legislature could not prorate the market as between the fields which could be economically served by the same line considering all relevant factors. In some states other than Texas it could very well be that this condition would exist in the state as a whole. I understand that in South Louisiana, as an example, many gas fields are located relatively near one to the other and that the gas exists in rather large quantities at the same approximate pressures. This situation, whether in Louisiana or any other state, to my mind, provides a practical factual situation from which gas proration as between fields could be accomplished to prevent the very undesirable result of selective buying.

As an example of the difference between oil pipe lines and gas pipe lines, many of the oil purchasers and pipe lines are interconnected so that if a purchaser of oil does not get his demand from a certain field he can purchase the same type of crude needed from another field or other purchaser through the means of interconnected network of pipe line systems throughout the state, or in case there is no line to the field and oil has been allocated to it, the oil can be trucked out; but in the case of gas, many fields have no connections and the pipe lines are not interconnected so that if a part of the market demand is allocated to a field that has no connection or allocated to a field above market demand, the allowable of gas for that field is lost and the purchaser finds himself short in meeting his demand.

State wide gas proration is an ideal system to strive for and as our reserves increase that is the only method that can be used to prevent selective buying. Under such a system each field can be allocated an allowable, based on an efficient withdrawal, that will prevent premature encroachment and coning of water; and the amount allocated to each pool or field should then be allocated, based upon a formula containing the factors given in the beginning of this paper, in order that each producer may have a fair share in the field's production.

TABLE 1

Prorated Gas Fields in the State of Texas

FIELD	ACREAGE PATTERN	METHOD OF PRORATION
DISTRICT No. 3		
Alief	160 + 15% tolerance = 184 acres	¾ (Acreage x Res. Press.) + ¼ (Potential)
Blue Lake	Less than 10,000 ft; 160 + 40 acres—last well Below 10,000 ft; 320 + 60 acres—last well	⅔ (Acreage x Reservoir) + ⅓ (Potential)
DISTRICT No. 4		
La Blanca	160 + 10% tolerance = 176 acres	½ (Acreage x wellhead press.) + ½ (Potential)
DISTRICT No. 6		
Carthage	640 + 10% tolerance = 704 acres	100% (Acres x Reservoir Pressure)
Navarro Crossing	320 Acres, Net of 152 Acres	Daily total field gas allowable & net Acreage of Unit
Navarro Crossing	320–40 = 280 x 0.4 = 112 + 40 = 152 acres	Total net acreage value field (Oil & Gas)
Oakwood	320 Acres, net of 152 acres	Same as Navarro Crossing
Rodessa	160 Acres	⅔ (Acreage x Wellhead Press.) + ⅓ (Potential)
Whelan	640 + 10% tolerance = 704 acres	⅔ (Acreage x Reservoir Press.) + ⅓ (Potential)
DISTRICT No. 7-B		
Sipe Springs	160 + 10% tolerance = 176 acres	½ (Acreage x Wellhead Press.) + ½ (Potential)
DISTRICT No. 7-C		
Eden	160 + 10% tolerance = 176 acres	½ (Acreage x Wellhead Press.) + ½ (Potential)
DISTRICT No. 10		
West Sour Panhandle	640 Acres	⅔ (Acreage x Wellhead Press.) + ⅓ (Potential)

Corzelius Case

The history of gas proration in Texas is in the main a story of recent events and a battle in the courts.

The Railroad Commission of Texas has recognized that gas must be prorated in fields in order to have ratable taking. Prior to the Corzelius Case the Railroad Commission of Texas prorated gas only in cases where physical waste occurred. However, the decision of the Corzelius Case gave the Commission power to prorate gas not only to prevent physical waste but to protect correlative rights.

The specific statute under which the Commission operates states that it was enacted for the protection of public and private interests against the evils of the production and use of natural gas under wasteful conditions by prohibiting such waste and by compelling ratable production.

Article 6008, Section 10, of the statutes reads as follows:

> "It shall be the duty of the Commission to prorate and regulate the daily gas well production from each common reservoir in the manner and method herein set forth. The Commission shall prorate and regulate such production for the protection of public and private interests:
>
> "A. In the prevention of waste as waste is defined herein;
>
> "B. In the adjustment of correlative rights and opportunities of each owner of gas in a common reservoir to produce and use or sell such gas as permitted in this Article."

At the same time to distribute the allowable ratably among wells in the field, based on the allocation formula adopted for that field after due notice and hearing, the Commission distributes the allowable, based upon such formula, to all wells in the field whether they have connections or not. This is done according to Article 6008, Section 20, which reads as follows:

> "In the event the Commission finds that the owner of any gas well has failed or refused to utilize or sell the allowable production from his well, when such owner has been offered a connection or market for such gas at a reasonable price, such well shall be excluded from consideration in allocating the daily allowable production from the reservoir or zone in which same is located until the owner thereof signifies to the Commission his desire to utilize or sell such gas. In all other cases all gas wells shall be taken into account in allocating the allowable production among wells producing the same type of gas."

Operating under the statutes previously referred to, the Commission has done these things with respect to the regulating of production of gas in Texas:

1. It has promulgated a general rule of statewide application which rule applies in the absence of a specific rule. This general rule limits the daily take from gas wells to a quantity not to exceed 25 percent of its open-flow potential capacity.

2. With respect to the production of casinghead gas, it has also promulgated a statewide rule which applies in the absence of a specific field rule, which statewide rule sets up a permissible gas-oil ratio of 2000 cubic feet per barrel. If the production of such quantity of gas per barrel of oil is deemed to result in an inefficient use of gas, then, after notice and hearing, it may pre-

scribe a permissible gas-oil ratio which testimony shows will result in the efficient utilization of gas to produce the oil. In some fields this permitted ratio is as low as 500 cubic feet per barrel; whereas, in other fields it may exceed 2000 cubic feet per barrel.

3. Another way that the Commission has sought to obtain the greatest utilization of the gas contained in a reservoir that is productive of both gas and oil is to allow the closing in of the wells that produce with ratios in excess of that prescribed by the Commission and to permit the transferring to and production from other wells of the allowable of such closed-in wells, provided that the transferred oil must be produced from wells that operate with gas-oil ratios lower than the operating ratio of the wells from which the oil is transferred.

4. The Commission has always advocated and encouraged the picking up of casinghead gas from oil wells and the returning of it to the producing formation where such is necessary for reservoir pressure maintenance and where such practice can be shown to result in a greater ultimate recovery of oil and gas from the reservoir. Many applications of such nature have been made and seldom does a week pass but that a hearing on some such application is held.

With respect to reservoirs that are productive of gas only, it might be well to point out that the most of these reservoirs in Texas, so far as potential capacity is concerned, lie along the Gulf Coast Area, and in what we refer to as the Panhandle District of Texas. For several years the Commission has been prorating natural gas in the Panhandle field, which is one of the largest gas reserves in the nation. Gas proration schedules are prepared monthly for the purpose of allocating among the various wells their proportionate part of the gas outlet assigned the field. Other fields in which gas is being prorated in Texas are the Alief, Blue Lake, La Blanca, Carthage, Navarro Crossing, Oakwood, Rodessa, Whelan, Sipe Springs, Eden, South Weslaco, McAllen, and the North Louise Field.

The reasonable, lawful, required production from any of the above fields is determined from nominations for the production from gas wells producing from each separate reservoir or zone, which are submitted to the Commission in affidavit form by purchasers of gas from the fields in question, and the Commission may, if there is a question with reference to nominations, adjust the allowable production, as determined by the above method, to the actual production from such reservoir or zone as it may determine from its records to be the most efficient rate in order to prevent waste. The allowable or production from each field is then distributed based upon the allocation formula for each field in question, on a basis of 2/3 rock pressure times acreage plus 1/3 potential or ½ acreage times rock pressure plus ½ potential, with the proration units ranging from 160 acres in some fields to 640 acres in other fields.

The Carthage Field is prorated on 100 per cent acreage times reservoir pressure and allowing 640-acre proration units. (See Table 1).

Another conservation measure which the Commission has been putting into effect in an effort to make the most efficient use of gas in a reservoir that contains both gas and oil is to place a volumetric displacement on the gas wells. Such a rule is designed to permit any gas well to void as much space in the reservoir daily as does an oil well producing from the same reservoir. It does not deny the rights of the operator that is situated in the gas cap area, but simply restricts his production of gas to a reasonable amount primarily for the purpose of preventing an undue rise in the gas-oil contact and the migration of oil from the oil column into the dry gas sand.

The application of the volumetric displacement rule has been instituted in a number of fields in the state, and this rule is used in the fields listed in Table 2.

TABLE 2

Oil Fields in State of Texas Wherein Volumetric Displacement Rule 6-B Is in Effect

FIELD	METHOD OF CALCULATION OF GAS WELL ALLOWABLE Gasoil	Volume Disp.	TOTAL GAS
DISTRICT No. 1			
South Campana	2000+	750 =	2750 x oil allowable x producing days
DISTRICT No. 2			
Burnell	2000+	750 =	2750 x oil allowable x producing days
Franeitas	12,500+	750 =	13,250 x oil allowable x producing days
Greta	2000+	750 =	2750 x oil allowable x producing days
Heyser	2500+	750 =	3250 x oil allowable x producing days
Lolita	2000	=	2000 x oil allowable x producing days
Porter	2000+	750 =	2750 x oil allowable x producing days
Refugio Heard	2000+	750 =	2750 x oil allowable x producing days
South Caesar	7500	=	7500 x oil allowable x producing days
Tom O'Conner	2000+	750 =	2750 x oil allowable x producing days
DISTRICT No. 3			
Anahuac	2000+	750 =	2750 x oil allowable x producing days
Cleveland	1500+	750 =	2250 x oil allowable x producing days
Clodine	10,000+	750 =	10,750 x oil allowable x producing days
Conroe—Main Sand	2700	=	2700 x oil allowable x producing days
Conroe—Upper Cockfield	2500	=	2500 x oil allowable x producing days
Fairbanks	2000+	750 =	2750 x oil allowable x producing days
Hardin	2000+	447 =	2447 x oil allowable x producing days
Lockridge	2000+	750 =	2750 x oil allowable x producing days
Midfields	2000+	2412 =	4412 x oil allowable x producing days
Picket Ridge	2000+	750 =	2750 x oil allowable x producing days
DISTRICT No. 4			
Agua Dulce			
Dabney Sand	2000+	750 =	2750 x oil allowable x producing days
Upper Pflueger	2000+	750 =	2750 x oil allowable x producing days
Middle Pflueger	2000+	750 =	2750 x oil allowable x producing days
Lower Pflueger	2000+	750 =	2750 x oil allowable x producing days
Simmonds	2000+	750 =	2750 x oil allowable x producing days
Sponberg	3000	=	3000 x oil allowable x producing days = Z — +
	Maximum of 640 acres		(Total Acres—40) x Z
Wright	2000+	750 =	2750 x oil allowable x producing days
Alice	2000+	750 =	2750 x oil allowable x producing days
Benavides	2000+	453 =	2453 x oil allowable x producing days = Z — +
	Maximum of 80 Acres		(Total Acres—10) x Z
Ben Bolt	2000+	757 =	2757 x oil allowable x producing days
Conoco Driscoll	10,000+	750 =	10,750 x oil allowable x producing days
Midway	2000+	750 =	2750 x oil allowable x producing days
Rincon	2000+	495 =	2495 x oil allowable x producing days
Turkey Creek	2000+	750 =	2750 x oil allowable x producing days
West Sinton	Maximum gas producing oil well in field—its Ratio + 750 x oil allow. x prod. days		
DISTRICT No. 6			
Chapel Hill	2000	=	2000 x oil allowable x producing days = Z
	Max. Acreage	= 640	Total Acres x Z = allowable
			40
Kildare	3500+	750 =	4250 x oil allowable x producing days
Winnsboro	2000+	750 =	2750 x oil allowable x producing days
DISTRICT No. 8			
Abell	2000+	965 =	2965 x oil allowable x producing days
Goldsmith	2000+	997 =	2997 x oil allowable x producing days
Kermit	3000+	750 =	3750 x oil allowable x producing days
Keystone Lime	5000+	750 =	5750 x oil allowable x producing days
North Cowden	4000	=	4000 x Field allowable oil x producing days = Z
			No. Wells
			Allowable = Z + 150% Z
DISTRICT No. 9			
Bryson	2000+	750 =	2750 x oil allowable x producing days

Gas-Oil Ratio Surveys

With respect to orders of the Commission concerning fixing of efficient gas-oil ratio limits within which oil wells may be produced, it would be well to point out that as early as 1937-38 the Commission instituted periodic gas-oil ratio surveys in the various fields where gas was a problem. In the application of these rules a gas well that produces with a ratio in excess of that prescribed by the Commission has its oil allowable reduced; the effect being that the high ratio well is allowed to produce as much gas from the reservoir in the production of its oil allowable as does a like well producing with a ratio within the limits prescribed by the Commission. In many fields surveys were formerly quarterly or semi-annually; since the war emergency, most of the periodic surveys are on an annual basis. The effect of such a rule is twofold in nature.

First, it makes the operator conscious of gas when he is completing his well and makes toward a better well completion.

Second, it has the effect of promoting workover operations where wells were originally so completed that the casing was set high and resulted in a penalty to the oil allowable.

Another type order which the Commission has entered with the purpose of encouraging the return of gas to the producing formation in oil and gas producing reservoirs provides that credit against the producing gas-oil ratio may be given for gas that is currently injected to the same formation from which it is produced. The application of such an order encourages injecting gas to the producing formation, since if there results therefrom a producing ratio in excess of that prescribed by the Commission the operator may secure credit

against this gas withdrawn for the gas that he has injected. This type of order does not penalize the operator in his oil allowable, if he injects a sufficient amount of gas to offset that which he has produced.

Under sound engineering and gas conservation practices prescribed and enforced by the Railroad Commission of Texas the venting of gas to the air has been reduced from 384 billion cubic feet or 37.43 per cent of all the gas produced in the state in 1935, to 55 billion cubic feet or 4 per cent of all the gas produced for the first six months of 1946. Most of the gas that is being wasted or vented to the air is casinghead gas which comes from oil wells which has always been a problem in preventing gas waste. However, the Commission has recently inaugurated a program to stop much of this waste with astounding results.

During the month of February, March, and April of 1946, the Railroad Commission held hearings in Corpus Christi, Houston, Fort Worth, and Midland, at which hearings it received reports from the industry as to the status of all conservation projects, then under consideration, dealing with the elimination of the flaring of casinghead gas in the State of Texas at that time.

As a result of these hearings and the data received from the industry as of November 1, 1946, it is shown that nine projects conserving 52 million cubic feet of gas per day have been completed, 16 projects conserving 221 million cubic feet of gas per day are in various stages of construction, and 44 plants designed to save 485 million cubic feet of gas per day are being planned. The projects already completed have cost $8½ million. These projects now under construction will cost $43,740,000, and those being planned will cost $75,090,000, or a total of $127,330,000. Figures submitted to the Commission showed that out of the total casinghead gas produced in March, 1945, 57.3 per cent was flared to the air. The new projects under construction will reduce the total casinghead gas flared by approximately 900 million cubic feet per day, and when all the existing projects are completed 18.4 per cent of the total casinghead gas produced will be flared.

Below is a table showing the utilization of all casinghead gas produced when all existing conservation projects are completed in the State of Texas:

	When All Existing Conservation Projects are Completed	
ITEM	Volume	Percent
Lease Fuel Sysyem	71	2.5
Extraction Loss	75	2.7
Plant Use and Fuel	173	6.2
Gas Life	31	1.1
Pressure Maintenance and Repressuring	427	15.3
Recycling	30	1.1
Carbon Black	372	13.3
Transmission Lines	1,107	39.4
Vented	514	18.4
	2,800	100.0

(Figures in millions of cubic feet per day).

In addition to the above conservation projects, it is believed that an addition of from 200 million to 300 million cubic feet of casinghead gas per day now flared may be and can be conserved, if the State of Texas and the operators completing these projects and those projects being planned in the future could be guaranteed that the threat and the encroaching powers of the Federal Power Commission would be curbed. It is believed that the threat of encroaching powers of the Federal Power Commission is a threat to the conservation of casinghead gas, in that it is believed by many that this Commission having succeeded in regulating the well-head price of casinghead gas by the natural gas companies that the Federal Power Commission is now seeking to control sales at the well-head by producers who are not gas utilities.

Contract Drilling, Accounting

■ CONTINUED FROM PAGE 49

used, we recommend the practice of keeping an operating experience record on each string of drill pipe in use. This record need not be complicated. It may be in card form, with information spaces for date of purchase, cost, size and length, operating days used and footage drilled. From such a record a comparatively safe field depreciation rate may be developed, either on a day or a footage basis.

Several contingencies can creep in to complicate this simple record, but they are not insurmountable. For example, drilling strings are sometimes transferred from one drilling area to another. This makes necessary an inventory appraisal of the value of the pipe at the date transferred, and a separate record of performance in the new area. Not necessarily a new card but a new record. Where the transfer is made because the pipe is no longer considered safe for use in an area of hard wear, the case is different. If a string is moved from West Texas, for example, after drilling two wells, because it is adjudged unfit for further work in that area, then the job costs for the two West Texas wells should absorb the cost of the pipe, less salvage value, if well cost figures are to be dependable, even though the pipe, as a shortened string, may be used for further drilling in softer or shallower formations elsewhere.

Where certain joints in a string fail and are replaced, as is often the case, the record is not necessarily affected adversely, because it is general practice to expense the cost of such replacement joints. Replacing a few joints does not add materially to the life of the string as such, and the cost of upkeep to the drilling string is included in the well cost accounts.

As suggested above, the inventory method of estimating drill pipe wear is used by some contractors, and in certain areas is reported to be satisfactory and acceptable to the Department of Revenue. It would seem that this method, to be acceptable, would need the support of some corroborating record much like the one described, or the pipe would have to be examined and valued by some one of the companies providing scientific inspection service, because if it were left to the toolpusher to estimate the value he would guess in terms of percentage of exhaustion.

Because there is such a direct relationship between use and wear in the drilling string, we have concluded that some form of the use method of depreciation is indispensable.

Day Work Costs

A brief comment is called for at this point on the need for acceptable average figures for the cost of operating drilling equipment on company time, because this is a weak spot in our accounting records. In the space of a comparatively few years the time required in this part of the operation of drilling a well has stretched from three or four days, waiting for the cement to set around the oil string and drilling out the plug, to a period of months in some cases.

Under a typical drilling contract the owner of the tools agrees to perform two distinct services. He contracts to drill a hole to specified depth at so much per foot, and then he agrees to rent the use of his rig and his men to the owner of the well for such other work as the owner may specify. For this last function he is paid an agreed amount per day or fraction thereof. He may, and often does, spend more time on day work than is required to cut the hole.

It is an obvious, but belatedly recognized, fact that the contractor must make his profit on both operations, and not depend on drilling profit to carry the day work as he used to do. The accounting obligation is to provide the contractor with a dependable daily average operating expense figure for the use of his rig on company time. Care must be exercised, also, to make certain that day work bears a fair share of overhead and equipment use expense.

We suggest that a fair and dependable figure may be developed by dividing the total of expenses accumulated under the first three Major Factors by the total number of days consumed in the three basic functions of rigging up and dismantling, drilling and day work. To this figure would be added any expenses incident to the particular job, such as derrick rental, water, fuel, etc., where these are furnished by the contractor. This procedure eliminates the one-time expenses such as trucking, derrick, pits, grading, etc., and such charges as bits and mud which are usually non-recurring in day work.

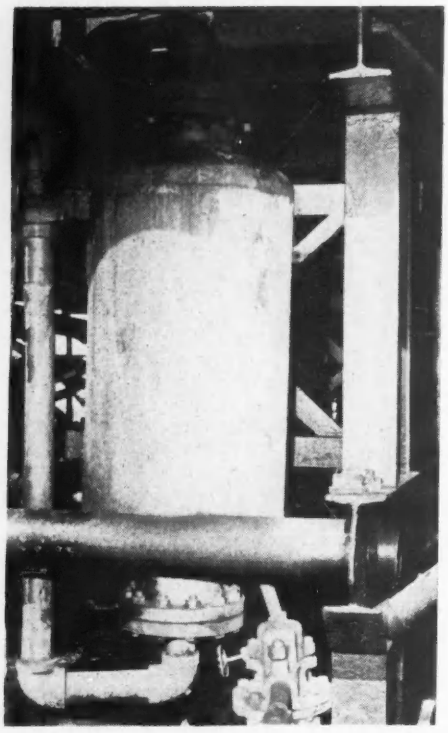
Any argument that this procedure weights day work unduly is offset, we think, by the tempering effect of the rigging up and dismantling days included in figuring the average.

Since days spent on company time are generally full payroll days, we can see no valid reason for making a lesser charge to this work for rig depreciation and overhead than is made to the drilling operation. The requirement on the machinery is often heavier in performing day work operations than is the case in the actual drilling operation.

Where use of the drilling string is required in day work operations, it is usual practice for the operator to pay an additional sum per day of use. This payment is based on the length of the string required, and is generally calculated on the basis of a rate per foot per day. Here, again, is definite need for a dependable cost figure for drill pipe wear.

That our suggested method of arriving at the average cost of day work is not fool-proof, and is open to argument, we are certainly not disposed to deny, and we are wide open to a better suggestion.

Steam Separator Mounted In Substructure



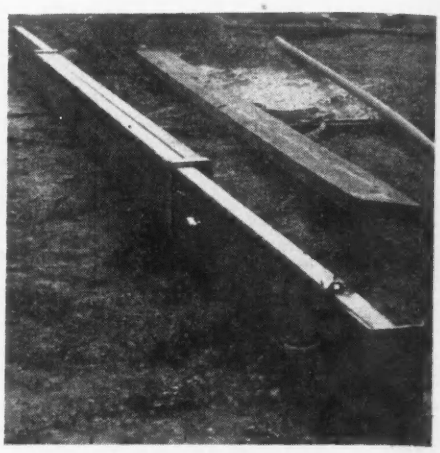
STEAM SYSTEMS

Due to the weight of the separator used on the steam line just ahead of the drilling engine throttle, mounting that unit on the ground is unsatisfactory, as any shifting of the support will throw excessive strain on the steam line and invite breakage. One contractor mounts this unit within the substructure which carries the drilling engine, cutting away transverse members to an arc corresponding to the outside of the separator shell, and then welding the shell to the cross members so that it, in effect, becomes a part of the substructure.

By connecting both steam lines to the separator through full swings, and with a 180-degree bend into the upper connection of the throttle, the separator is freed of expansion and vibration stresses, and joints remain tight throughout a drilling campaign.

The steam trap is likewise carried within the frame and both it and the separator are so well enclosed by the substructure that accidental contact by a crewman is almost impossible.

Telescoping Stabbing Board



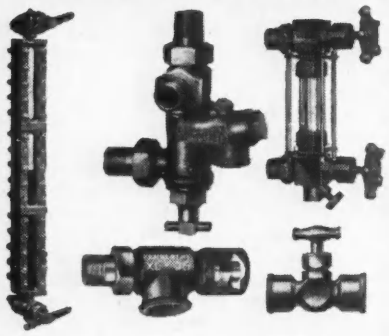
RIGGING UP

Rigging up a new stabbing board each time casing is run may be eliminated by construction of an adjustable board similar to that used by one company. It consists of two 3x12-inch planks which overlap approximately one-half their length and which are held together with rectangular steel straps, provision being made for the planks to be slipped in or out to obtain the length required to span the distance between the rig girts of the derrick being used.

When the proper length has been determined, the planks are locked together by tightening a large hand-operated wing nut on a long bolt which passes through matching adjusting slots cut in both planks. Heavy steel plate angle clips bolted to the ends of the planks allow the unit to be hooked over the girt members.

Simplifying erection of the plank assembly is a pair of eye-bolts, one at either end and on the upper side of the plank, by which the unit may be quickly rigged for hoisting up into the derrick.

PENBERTHY
QUALITY PRODUCTS



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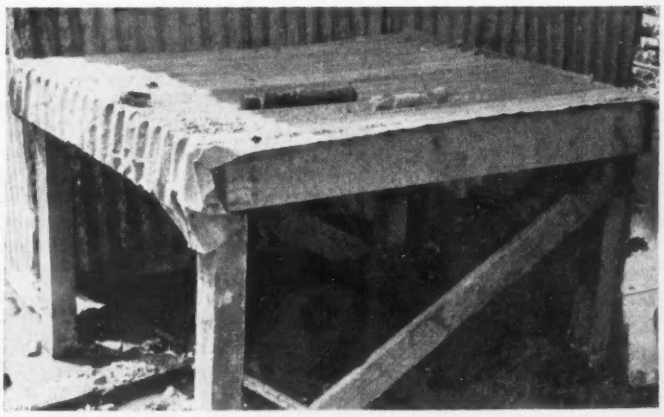
Corrugated Iron Table Aids Core Examination

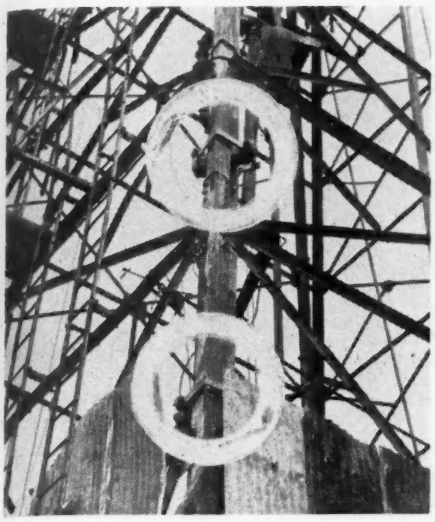
CORE EXAMINATION

The unusually convenient inspection table used by geologists of one company greatly facilitates examination of cores at the well site. The table consists of a small wooden framework at convenient working height which is decked over with two panels of corrugated galvanized iron. Provided with a slight slope for drainage of excess mud and water, the table corrugations simplify inspection of the cores, eliminating necessity of stacking of numerous core pans.



Simple to build and carry with the rig equipment, this handy table will save considerable time in the spot checking of cores on the job, and keep them in proper sequence during examination.

Wooden Pads Absorb Standpipe Vibrations



STANDPIPE PROTECTION

Padding the clamps holding the mud standpipe to the corner of the derrick is the method used by one operator to cut down excessive vibrations which otherwise would be transmitted to all parts of the rig structure. At every point where the standpipe is clamped to the rig corner a block of wood is placed between the rig angle and standpipe, and the entire assembly then clamped together tightly with extra long bolts passing through the two outside steel bands.

Not only is vibration reduced by this method of support but it provides a more satisfactory means of securely holding the pipe in place, the wood providing a "bite" which provides more friction between the several surfaces.

Suction Line Support

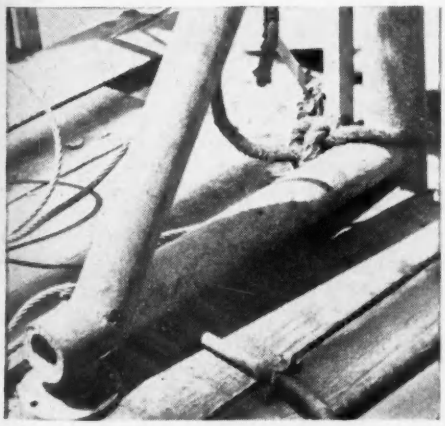
Use of a joint of drill pipe as the drum on which are wound the levelling lines used to support the strainer—or mud pit—ends of the suction lines permits one contractor to eliminate the loss of time usually incurred when rigging up the pits. Instead of a clamping device for the pipe ends, he uses a sturdy pyramidal stand, welded up from 2-inch pipe and angle iron, with a saddle for top which is formed to fit snugly around the size of drill pipe used as a drum or support.

SUCTION LINES

On one side of the support is welded a length of 2-inch pipe, extending to the left of the unit as shown, and serving as backstop or rest for the chain tongs used to turn the drum so as to adjust the level of the strainers in the pit.

Selective setting of the suctions is accomplished by slipping the turns of the rope supporting the higher pipe until it reaches the proper relation with the other, after which the pipe is rotated until the desired setting is reached.

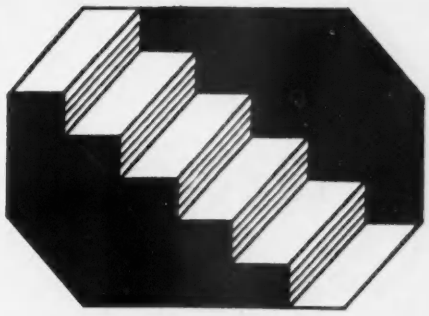
Flange On Back-Up Post



BACK-UP POST

In order to lend rigidity to the tong back-up post, one company makes it a practice of welding to the inside toe of the unit a heavy 2-inch flange by which the post may be secured to the floor. The flange is separated from the bottom of the stand by a close nipple which is welded into the toe of the horizontal member as shown. Upon rigging up, it is a matter of but a few minutes to spot the back-up post and anchor the floor flange by means of nails or screws driven into the derrick floor.

The flange not only provides a better bearing surface on the planking, but prevents the unit from swinging sideways should the pull tend to turn or tip it to one side.



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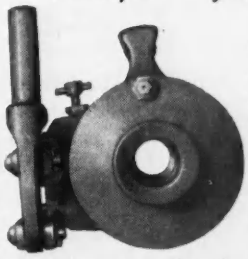
It's All in the **HOLE** — *of the Simplex Jenny*



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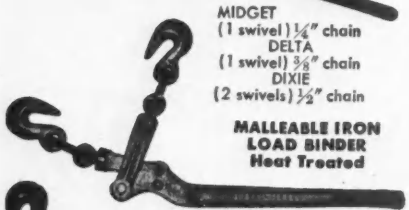
PHILADELPHIA, PA.
Manufacturers of Quality Rope
Since 1804

LOAD BINDERS

MIDGET
(1 swivel) ¼" chain
DELTA
(1 swivel) ⅜" chain
DIXIE
(2 swivels) ½" chain



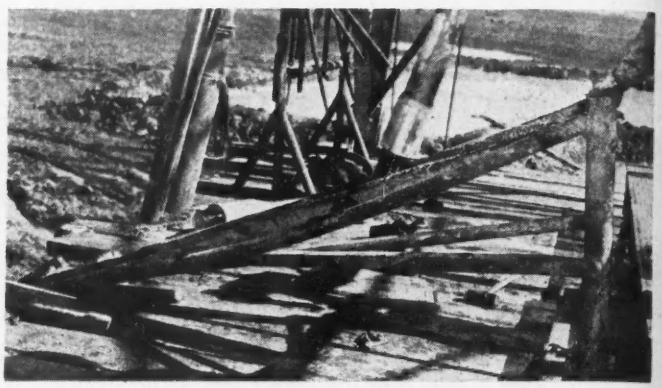
LONE STAR No 1—14 lbs.
(2 swivels ½" and ⅝" chain
LONE STAR No. 2—16½ lbs.
(2 swivels) ½" and ⅝" chain

No. 1—10 lbs.
(2 swivels) ⅜" and ½" chain
No. 2—17½ lbs.
(2 swivels) ½" and ⅝" chain

No. 3—3 Pulleys, plain bearings, ⅜" rope
No. 33—3 Pulleys, roller bearings, ⅜" rope
No. 4—4 Pulleys, plain bearings, ½" rope
No. 44—4 Pulleys, roller bearings, ½" rope
No. 88—4 Pulleys, roller bearings, ⅝" rope

DURBIN-DURCO
Manufacturers of Certified Specialties
Drop Forged and Malleable Iron
6611 OLIVE ST. ROAD—ST. LOUIS 5, MO.

Skidway Made of Salvaged Casing Aids Laying Down Pipe



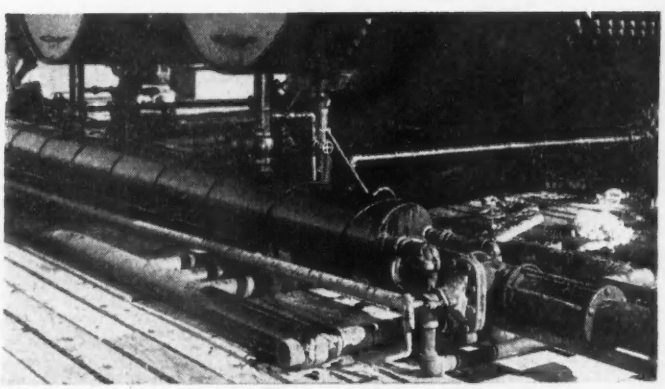
To lighten the work of handling the pipe end when laying down a string, one contractor has worked out an all-welded skidway which takes the pin end of the joint with a minimum of swing from the vertical, and which guides the pin outward and away from the table as the elevators are lowered.

PIPE HANDLING

The rack consists of a section of six-inch extra heavy pipe, split longitudinally, and long enough to reach from the point near the table to some 6 inches beyond the edge of the ramp to the run out platform. The inner end of the pipe is supported on a well-braced stand at a height of three feet from the derrick floor, transverse struts stiffening the trough so that it will not sag, even when a joint is dropped heavily on it. The skidway carries the pin end until the elevators have been lowered enough to support the run of the pipe in the trough. The elevators are removed when the joint has come to rest in the trough and when the lower end is in position to be picked up by the hook on the run-out buggy.

To properly lubricate the skidway it is only necessary to occasionally spread a little joint compound along the track. Sud lubrication would also prevent the drill pipe from cuting into the skidway.

Exhaust Steam Used For Boiler Draft Blower



Utilizing a portion of the power still remaining in exhaust steam after it has powered draw works or mud pumps, one contractor pipes the exhaust through a combination blower manifold and feed-water heater. Led directly under the smoke box end of the boilers, in line with the center of the stacks, the steam receiver has a three-inch riser with control valve piped into each smoke box. On the end of the riser within the boiler end is set a locomotive-type blower, directing the flow of exhaust steam in a conically shaped blast into the throat of the stack.

BOILER OPERATION

Since the flow of exhaust steam is directly related to the steam demand, this draft control is automatically timed with increased fuel feed, and quicker steaming is assured. For use in getting up steam, or maintaining forced draft when no unit of the drilling rig is operating, the usual ½-inch steam line for blowing or draft purposes is tied into the exhaust steam line above the control valve.

The "big inch" pipe which serves as feed-water heater and receiver is carried on the same foundation as the jacks which align the smoke box ends of the boilers, but is removable for transportation as a unit.

NEW BEDFORD "NONE BETTER" PURE MANILA — It's Back!

and still "NONE BETTER"

▲ For nearly a century New Bedford Pure Manila Cordage has served the men demanding top quality and extra service. However, during the past five years it has not been available in the oil country because of wartime conditions.*

▲ Now, New Bedford Pure Manila is back to again take over its established place in the field.

▲ Made from the highest grade manila obtainable, New Bedford is processed with the most modern and scientific methods. When New Bedford Pure Manila is on the job you know you have the best . . . for there's "None Better".

**While Pure Manila was at war, New Bedford's TOPSAIL stepped in to become the favorite cordage "pinch hitter."*

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SPEED AND ECONOMY

Pipeline Construction
with
Personal Supervision
on ALL Jobs

Specialists . . .
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Reconditioning Pipeline Work

Equipment . . .
2 Complete Spreads of equipment, capable of handling up to 26 inch pipe

BRITTON & CLARK
CONTRACTING CO.
401-423 N. Main St. Fort Worth 6, Tex.

of Pipe Laying Gangs with **BUCKEYES!**

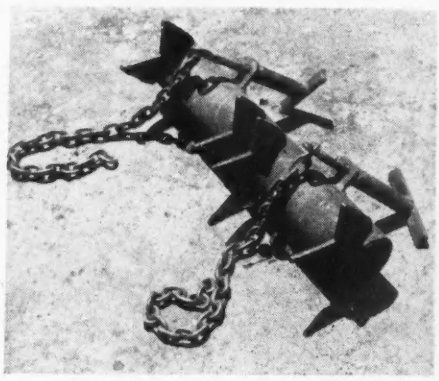
This pioneer line of trenchers has kept a jump ahead of pipeliner's needs. Buckeye Mainliners get down the big pipes faster; keep ahead of layers and welders. They've got the stamina for toughest going in any country. Models 32 and 48 for main lines; Models 11 and 12 for small gas, gasoline and gathering lines.

BUCKEYE TRACTION DITCHER COMPANY
Findlay, Ohio
Buckeye
TRENCHERS. SHOVELS. CRANES
BACKFILLERS. TRACTOR EQUIPMENT.

Portable Aligning Device Speeds Pipe Line Welding

WELDING AIDS

Aligning and tack-welding small pipe lines are speeded by a shop-made device, simple to build, easy to carry on the truck, and involves no special equipment to operate. It consists of a short length of pipe, three-inch or larger, depending on the range of sizes to be welded, and to which has been attached four V-shaped pieces of pipe arranged as shown. The two ends of the pipe to be welded are abutted together in the center of the two centrally-located, closely-spaced V-plates, then clamped in that position with two chain-and-bolt type vises attached to ears on the sides of the body of the device. Several inches takeup is possible in the long shank bolts and nuts, the latter made of pipe and equipped with a convenient T-handle for easy cinching by hand. Coarse adjustment is made by looping the chain over the pipe and hooking the nearest links into split ears located on one side of the device, then taking up remaining slack by turning the nut on the bolt end of the chain.

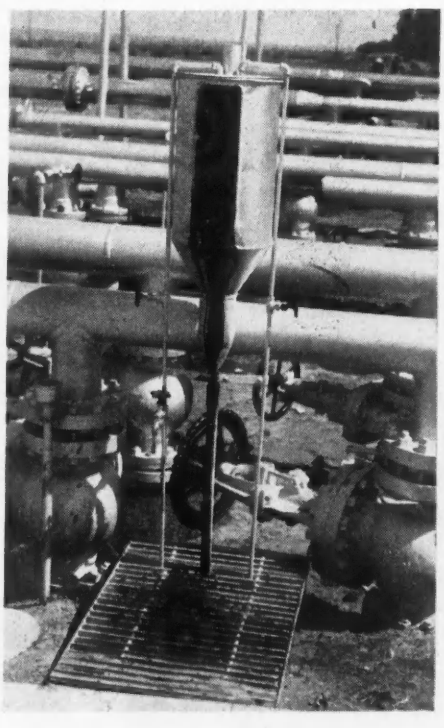


Easy to carry about on portable field equipment, and being light enough to be handled by one man, the device is saving considerable time, it being possible for the welder's helper, after lining up the work in the clamp, to leave and do other lining-up work while the welder completes the entire job without further assistance.

Improved Sampling Device Equipped For Lighting

SAMPLING DEVICES

Making a quick, clean job of obtaining pipe line oil samples out of what usually is a dirty chore involving splashing oil over hands and containers, was achieved by the superintendent of a pipe line station through the installation of an elevated, partially-enclosed sample-taking housing supported upon a swage nipple and length of pipe, the latter also serving as a drain outlet. The installation is a cylindrical container having a conical bottom and which has a tall, narrow opening in the front through which sample cans may be passed. Oil sample lines are brought up from the buried pipe line and into the top of the can, their ends pointing downward at a convenient height inside so as to clear the top of a standard sample can. Interior of the container is floored with hardware cloth or expanded metal, permitting the can to be filled in its normal upright position, with overflow, if any, running into the waste drainoff below.



Adding to the desirability of this type of installation is the provision made at the top of the enclosure for inserting a flashlight so the night operator can watch the progress of the filling operation. It consists of a small collar welded into a hole at the center of the top which has an inside diameter that will snugly hold a flashlight body placed inside it. The entire installation is at convenient height, with valves at hand height beside it.

PIPE LINE HINTS

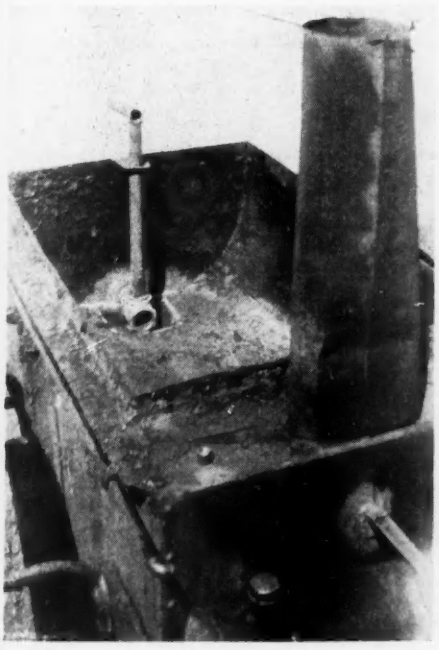
Neat Expansion Loop Built On Highway Bridge

BRIDGE CROSSINGS

Realizing the necessity for some provision that would afford resiliency to absorb the vibration of traffic and simultaneously permit expansion and contraction in ⅛-mile length of welded pipe line that is suspended and supported from the longitudinal girders and the abutments of a concrete highway bridge, one pipe line contractor fabricated and installed an expansion loop of short lengths of line pipe and five factory-made 90-degree tube turns. This five-cornered, double offset expansion loop was aligned and welded into the line so that three of the 90-degree bends forming the longest section of the loop lie in a vertical plane alongside the bridge railing. The other two 90-degree bends —those at the ground level and joined by a short pup joint—lie in a horizontal plane.

Such an installation not only serves its intended purpose, but also presents a well-proportioned appearance which enhances rather than detracts from the scenic value of the highway bridge.

Tap Valve Inside Enamel Kettle Prevents Breakage



PIPE COATING

By placing the tap valve inside the enamel kettle, one pipe line contractor has successfully eliminated the hazard of breaking the valve off during movements of the kettle when spot enameling line pipe. Relocating this valve inside the kettle also prevented the valve from freezing up with enamel due to the difference in temperature inside and outside the kettle, especially during the winter. The valve was located at the bottom of the kettle as shown, with a handle fabricated from two pieces of ¾-inch pipe, the stem being 28 inches long and the lever eight inches long, the lever being welded at right angles to the stem, which was notched to fit over the tapered plug of the tap valve. The pipe and the valve stem are drilled so that a cotter pin may pass through both when the pipe is placed over the tapered plug. The upper end of the valve handle extension is supported by a flat piece of 3/16-inch plate steel cut three inches wide and bent at right angles and welded to the kettle.

A hole large enough to barely pass the pipe stem was drilled into one end of the flat steel to form a sturdy support for the handle. The kettle lid is notched to accommodate and fit closely around the pipe stem and handle.

PIPELINE "Know-how"

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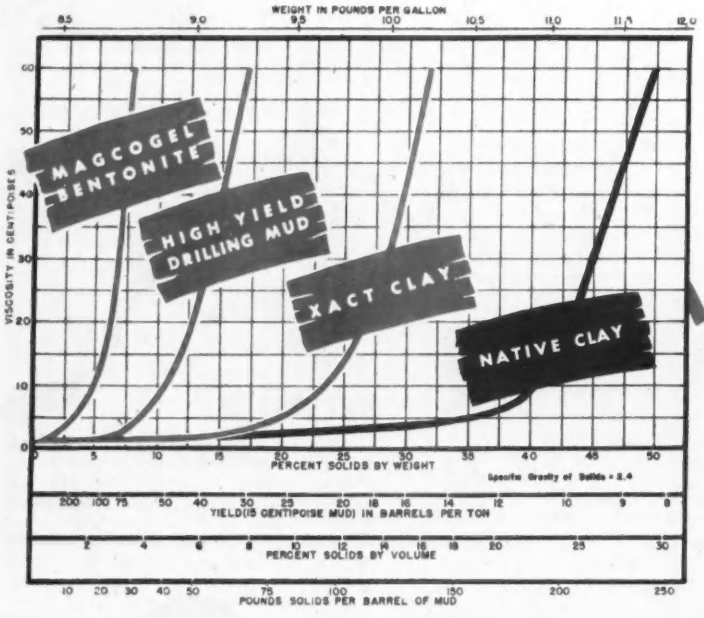
CLAY for every drilling need

Magcobar offers twenty-four hour service from conveniently located dealer stocks of Clays to meet every drilling need. Field service engineers to assist in their use at the rig.



This chart provides a convenient method of comparing the characteristics of Magcogel Bentonite, High Yield Drilling Mud and Xact Clay with native clay.

MAGCOGEL BENTONITE . . . Made from the finest gel forming colloidal Wyoming bentonite. Careful control of processing assures uniformity of Magcogel Bentonite — mixed with water it yields approximately 100 barrels of 15 centipoise mud per ton.

HIGH YIELD DRILLING MUD . . . A ready-mixed mud in dry form that will yield approximately 50 barrels of 15 centipoise mud per ton when mixed with water. Easy to use. Most economical for building a balanced drilling mud.

XACT CLAY . . . Although a low yield clay, Xact has exceptionally good particle size distribution and makes mud with a very low water loss. It yields 18 to 20 barrels of 15 centipoise mud per ton when mixed with water.

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DRILLING MUD SERVICE

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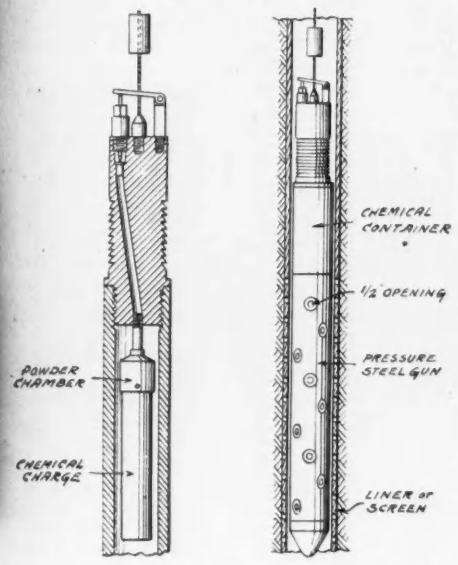
NEW EQUIPMENT LITERATURE

For additional information, use mailing card inserted opposite this page

1—Chemical Expansion Device

Another wartime development has been successfully applied to oil well reworking methods. It is the "Patten Process" of chemical expansion in liners and screens of opposite perforations in the



casing of oil wells to chemically heat-treat producing sands under expansion pressure, thereby thoroughly pulverizing any deposit of cement in the hole and destroying corrosion or scale.

It is claimed to liquefy drilling mud and dissolve cement, paraffin, asphaltum or other similar deposits. This expansion of chemical pressure enters the sand after forcing free any obstruction formed in the liners or screens or perforations in the casing and opening new channels in the sand as well as pressure-heat cleaning the old openings.

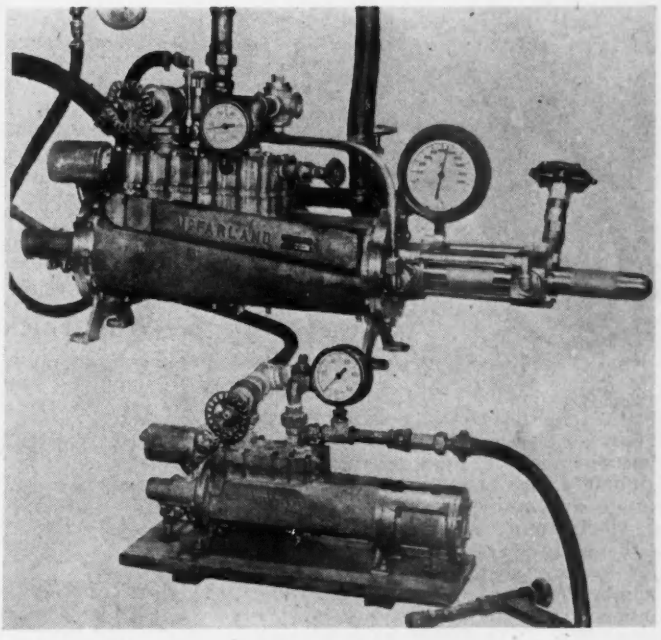
The method described above is carried out with the use of high-pressure guns, either 2½ or 3¾ inches in diameter and approximately six feet in length. It resembles a perforating gun in that it contains 32 openings, each ½ inch in diameter and sealed with metal discs. Atop these openings is a two-foot length steel chemical container and a one-foot steel firing head containing a powder chamber, cartridge container and a firing pin. Maximum safety is assured by the method of firing, which is through the use of a "go-devil." The entire assembly is lowered into the well with a 7/16-inch steel line from a service truck to any predetermined depth.

A column of fluid is used as an upper packoff. Upon firing, a hot chemical pressure is built up and expands out all 32 openings simultaneously with an 1800-pound chemical expansion pressure. Production in old wells has been known to increase 2½ to 15 times previous rates without damage to well equipment.

The Oil Well Engineering Company, 531-32 Esperson Building, Houston.

(Check item 1 on postcard for more information.)

2—Testing Units



Hydrostatic testing units and pressure pumps requiring no prime mover were recently introduced. The units, available in two sizes, operate on water, air, gas or steam pressures and discharge liquids or gases at pressures directly proportional to operating pressures.

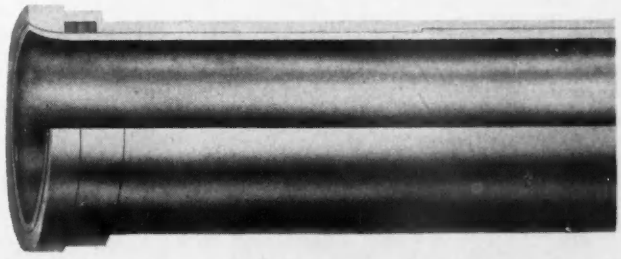
These units are double-acting reciprocating pumps, available with or without booster attachments. Main castings and most parts are of high strength aluminum bronze. They are non-sparking and may be safely used when fire and explosion hazards are great. The units are light weight and can be operated in any position, even under water. They are said to be free of vibration and need not be fastened down during operation.

With the 6-5¼ unit and booster, a discharge pressure of 12,000 pounds per square inch may be obtained with the unit operating under ordinary city water pressure at 60 psi. Other ratios are obtained by changing the cylinder and piston in the booster. The 6-5¼ unit operates at a ratio of .¼ to 1. The small 3-2½ unit operates at ratios from 2 to 1 up to 4½ to 1. An outstanding feature is that all discharge pressures are confined to the booster; the highest pressure to which the body is subjected is the input operating pressure. Desired pressures are maintained automatically once they are reached.

McFarland Manufacturing Corporation, 1630 Roberts Street, Houston.

(Check item 2 on postcard for more information.)

3—Liner Sleeve



A satisfactory and economical method of reclaiming pump liner by the use of a specially designed liner sleeve has been developed. The illustration shows the design of this renewable-sleeve pump liner. At left is the offset to hold oil-resistant, rubberized duck hydraulic packing which protects the liner body against the cutting effect of abrasive mud moving through the pump. It also shows the manner in which the sleeve is rolled on the flange end of the liner. The manufacturing process involves (1) removing all cuts and grooves from the liner body; (2) cutting the offset in the flange to take the packing; (3) heat-treating the 4145 to 4150 steel liner and machining it slightly larger than the liner body; (4) pressing the sleeve into the liner body; (5) rolling out the sleeve on the flange end; and (6) honing with a mocrohone bore to size.

Any pump liner which has a ⅝-inch wall thickness can be reclaimed to the same size. Any pump liner with ⅜-inch wall thickness can be reclaimed in reduced sizes. Liner sleeves are used for reduced sizes up to and including ¾-inch wall thickness. This provides a range of reduced sizes covering 1½ inches. All liners must meet a hardness requirement of 60-50 Rockwell with a tolerance of three points before shipment is made. A new liner guarantee is made of this product equal to those on carburized and flame-treated liners.

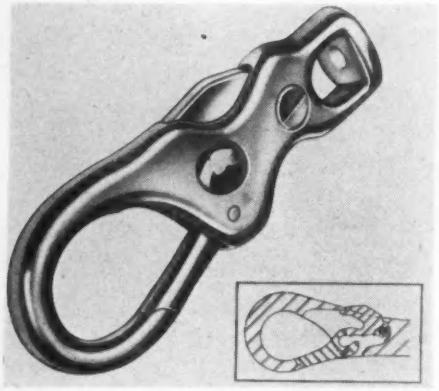
Specialty Sales Service, 330 West 25th St., Houston.

(Check item 3 on postcard for more information.)

4—Self-Locking Hook

A simple, self-locking device that may be adapted to hooks used in the oil industry was recently announced.

This self-locking hook has a fulcrumed latch member (or finger) that



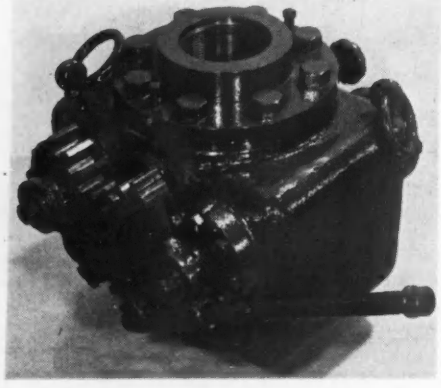
closes the opening into the hook—and is retained in this closed position, so that it can not be accidentally swung inward, thus opening the hook, as result of the latching finger being struck on the outside by an extraneous object. For swinging the latching finger into open position, a manually-operated spring-held member is manipulated. A portion of this member engages a part of the latching finger at a point a substantial distance away from its fulcrum, so as to effectively maintain the latching finger in position to close and lock the hook.

The latching finger has an effective inter-engagement with the free end of the hook which enables it to effectively resist laterally impressed strains or pressures that would otherwise tend to disengage the free end of the latching member from the free end of the hook. Patents held by W. H. Foster, 4622 Kingswell Avenue, Los Angeles 27.

(Check item 4 on postcard for more information.)

5—Blowout Preventer

A new, compact, 10,000-pound test tubing blowout preventer and wire line valve designed for high pressures was recently announced. Pressure is closed off by oil-resistant Hycar rubber rams



which seal around the wire line or tubing string. The design of the rams is such that the greater the pressure applied against them, the tighter the seal. The rams are opened or closed by a 90-degree turn of the ram arm. The new 10,000-pound test valve weighs 430 pounds; the valve body being a 16-inch cube.

The new preventer can be quickly and easily adapted to wire line or tubing service. Rams can be changed by removing the top flange and taking out four studs. With "blind" rams, the valve will close off around any size measuring line. With proper size pipe rams, the tubing blowout preventer will accommodate any size tubing up to 2½-inch external upset. It is furnished with either screw or flange connections. The valve may be adapted to tubing jobs, inside cutting and fishing jobs, and running large tubing calipers on measuring lines.

Oilfield Machine and Supply Company, P. O. Box 2172, Houston.

(Check item 5 on postcard for more information.)

6—Wall Thickness Gauge

The Audigage is a new, portable, self-contained instrument designed to measure the thickness of many materials, including steel, from one side only. Its application to problems of thickness de-

termination of pipes, storage tanks, pressure vessels, etc., is said to be rapid, accurate and reliable.

The device utilizes a crystal-type gauge head, powered by a frequency-modulated electronic oscillator. When the vibrating crystal is applied to a wall surface, mechanical resonance of the wall thickness can be produced directly below the crystal. The fundamental frequency at which the wall section will resonate is directly proportional to the velocity of the sound in the material and inversely proportional to its thickness. The wall thickness will also resonate at all harmonics of the fundamental frequency. The Audigage provides a means whereby audible signals are produced corresponding to harmonic resonance. The frequency difference between any two adjacent audible signals as read on the tuning dial is readily converted into wall thickness on a concentric thickness scale.

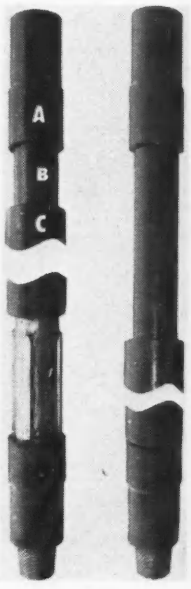
The character of the audible indications varies with several factors, such as the kind of material, condition of reflecting surface, backup liquids, process scale, etc. These factors provide useful information, but do not influence the accuracy of the thickness measurement. This new product may be characterized by its acoustic indications, sensitivity, compactness, light weight, accuracy, direct reading and battery operated. It may be applied to steel, aluminum, brass, copper, glass, and other materials, and covers a range from ⅛-inch to 12 inches.

Branson Instruments, Inc., Danbury, Conn.

(Check item 6 on postcard for more information.)

7—Drill Collar

Designed to eliminate stuck drill collars in key seats is the Burris key-seat drill collar illustrated. In addition to freeing stuck drill collars, it is said to act as a stabilizer for the drill stem and eliminates the necessity and hazard of running line reamers through dog-legs in the hole. The makers assert that it has proved beneficial in drilling directional holes where key-seats naturally occur at depths where whipstocks are set.



The key-seat drill collar is 12 feet in length and is composed of three main parts: (A) bumper sub, (B) mandrel, and (C) sleeve. The complete assembly is located immediately above the drill collars. The mandrel is 5¾ inches outside diameter and 2¾ inches inside diameter, and connects the bumper sub with the lower drill collar sub. Around the mandrel fits the hollow sleeve. the diameter of which is slightly larger than the drill collars. The sleeve has a two-foot travel on the mandrel which is splined for the lower 14 inches. When the sleeve is in its upward position, the lower shoulder clears the top splines by ten inches. In this manner, the drill stem is free to rotate while the sleeve remains stationary.

In operation, the key-seat drill collars are used to clear the hole upon pulling the drill stem to prevent the regular drill collars from becoming stuck. If a tight section is encountered, and the key-seat collar becomes stuck, the driller may lower the string two feet and bump the sleeve until it becomes free. The sleeve may also be bumped upward until the tight section has been cleared. Though the sleeve is frozen in the hole, the drill stem may be lowered and rotated. On rental from J. J. Burris, 2430 Albans Road. Houston.

(Check item 7 on postcard for more information.)

8—Thread Protectors

Introduced only a few months ago, a new line of heavy-duty thread protectors are said to be proving their worth. Made from tough, fabric-reinforced PBX special rubber, they are free from sulphur and other ingredients likely to cause corrosion. These thread pro-

tectors are designed both to absorb shock and to shield threads during handling and shipping. They are made in a variety of sizes for both pin end and box end, standard API right- and left-

hand threads in regular and full-hole types. They may be applied and removed for reuse. Vent and drainage holes permit the drainage of fluid, but the threads are sealed from exposure and and damage.

They are designed for use on drill pipe and all heavy-duty items such as drill collars, kelly subs, fishing tools, reamers, bits, and are quickly applied to prevent damage on all heavy items having exposed screw threads. The makers claim their use and long life result in great savings in time lost due to tool fitting, rethreading and replacement.

Patterson-Ballagh Division, Byron Jackson Company, 1900 E. 65th St., Los Angeles 1.

(Check item 8 on postcard for more information.)

Literature

9—Pipe Laying

"Hills, Bends, and Crossings" is the title of a new 12-page color booklet which highlights the task of pipe laying from initial pioneering to back-filling in its graphic presentation of the story behind this country's vast network of pipe lines. It includes on-the-spot stories of material wasting, furrowing, stringing and stabbing-in, doping and wrapping, cleaning and priming, welding and hauling.

Caterpillar Tractor Company, Peoria 8, Ill.

(Check item 9 on postcard for more information.)

10—Prefabricated Buildings

"Steel Buildings by IDECO" is the title of Bulletin B-46, describing many types of prefabricated buildings for all industries. The three-color bulletin is 32 pages long and contains numerous photographs illustrating each of the various types of metal structures and the details of construction. Specifications of these modern-design buildings are listed and line drawings clearly indicate principal parts.

Prefabricated structures have been designed to meet the needs of the natural gas, petroleum, warehousing, railroad, electrical, metal working, ceramic, aviation, distilling and machine tool industries. Photographs illustrate a late addition to the structural types . . . the portable steel sectional building suitable for camp buildings, mess halls, field offices, etc.

International Derrick & Equipment Company, Columbus, Ohio.

(Check item 10 on postcard for more information.)

11—Centrifugal Pumps

Recently issued was an eight-page bulletin describing a new line of centrifugal pumps ranging in capacity from 40 to 900 gallons per minute with heads up to 200 feet or higher. Included in the bulletin are details of the hydraulic design which the manufacturer says results in higher pumping efficiency for all classes of general service . . . efficiencies well in excess of 80 percent for pumps as small as 2½ inches.

Bulletin 200, The Carver Pump Company, Muscatine, Iowa.

(Check item 11 on postcard for more information.)

MERRY CHRISTMAS
and [it can be] a
HAPPIER NEW YEAR
with JENSEN PUMPING UNITS

JENSEN BROTHERS MANUFACTURING CO.
. . . Coffeyville, Kansas, U.S.A. . . .
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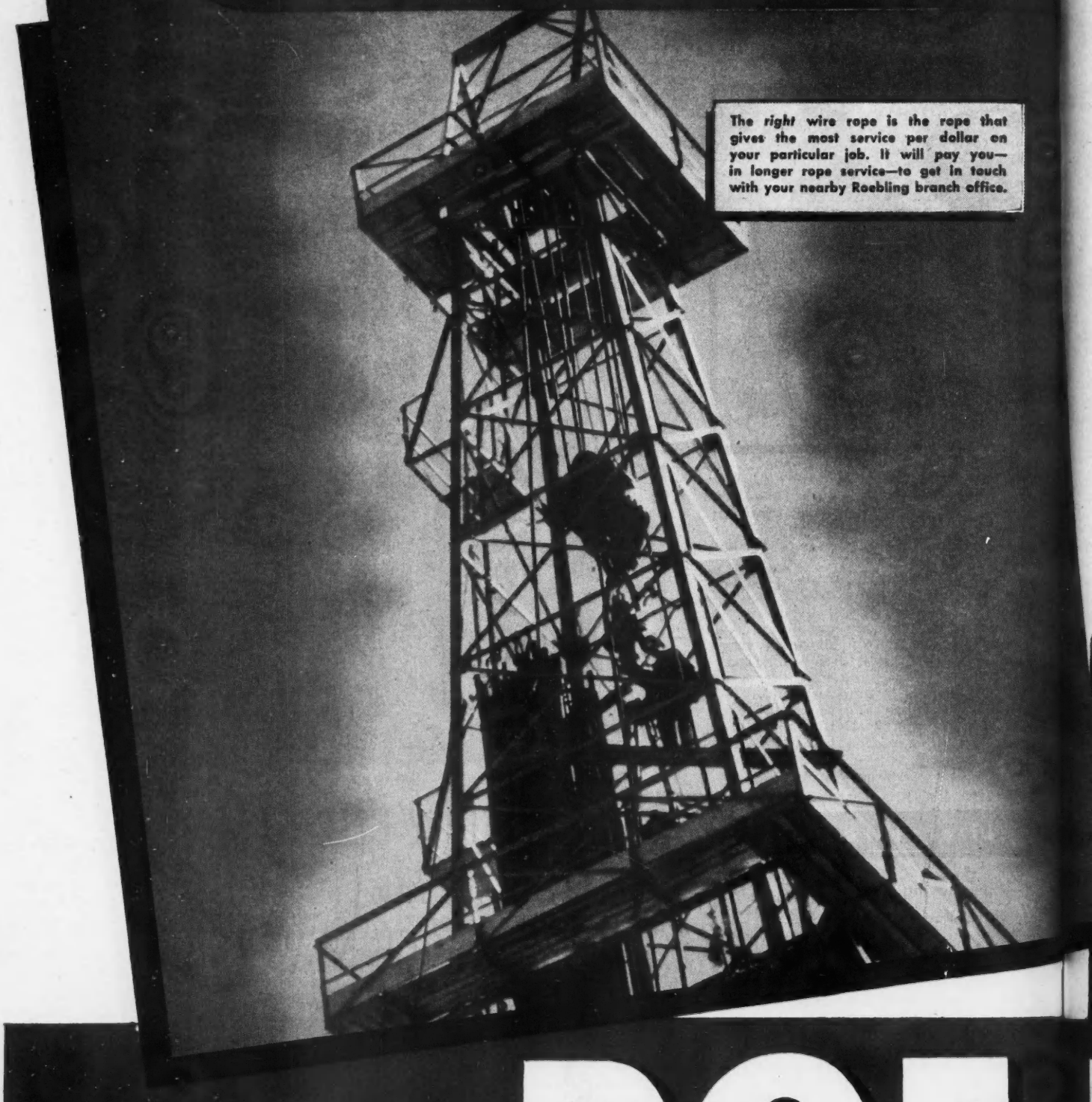

The *right* wire rope is the rope that gives the most service per dollar on your particular job. It will pay you—in longer rope service—to get in touch with your nearby Roebling branch office.

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Wire Rope and Strand • Fittings • Slings • Aircord, Aircord Terminals and Air Controls • Suspension Bridges and Cables • Aerial Wire Rope Systems • Ski Lifts • Electrical Wire and Cable • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Screen, Hardware and Industrial Wire Cloth • Lawn Mowers

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. . . and get lowest rigging cost!

YOU DON'T ALWAYS have the time to study the often obscure details affecting wire rope service on your installations. But your Roebling Field Engineer is constantly making such studies.

His daily contacts include tracking down the facts on practically every type of wire rope installation. He has specialized knowledge of wire rope usage . . . and of wire rope, too.

After careful study the Roebling Field Engineer can help you choose the *right* rope . . . the one that will give you top service per dollar. Of course, he will recommend Roebling "Blue Center" Steel Wire Rope. For here is a complete line—both preformed and non-preformed—where he can find the wire rope that combines the right balance of strength and flexibility, of fatigue and abrasion resistance.

Call or write our nearest branch office. Get in touch with your Roebling Field Engineer.

JOHN A. ROEBLING'S SONS COMPANY

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Wire Rope Distributed by: THE NATIONAL SUPPLY CO.
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Testing a length of Roebling "Blue Center" Steel Wire Rope is important — to you. It gives engineering data to your Roebling Field Engineer . . . information that can save your wire rope dollars.

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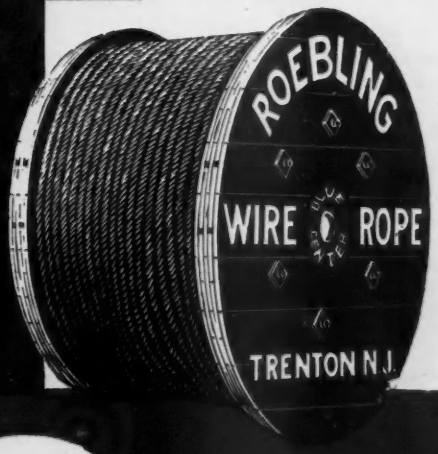

BLING

JAR ROEBLING

WIRE PRODUCTS

Compact Commission

■ CONTINUED FROM PAGE 31

types of disposal except where there are bays, gulfs, etc.

Seventy-one percent of the nation's oil producers are stripper wells which average 2.1 barrels per day or 13.5 percent of the nation's production during 1945, E. G. Dahlgren, assistant Compact secretary, reported. Stripper well acreage comprises 46 percent of the nation's total oil acreage, he said.

Franklyn Waltman, director of public relations of Sun Oil Company, pointed out the community of interest between the Commission and components of the industry and appealed for a united effort to eliminate misunderstanding and lack of knowledge.

F. R. (Gus) Frye of Michigan, was elected chairman of the Commission's Research and Coordinating Committee, succeeding Walker T. Pound of Oklahoma. Jack Baumel of Texas was named vice chairman.

Commission members voted to hold three instead of four regular meetings in 1947 but gave the executive committee authority to call a fourth meeting. The site and date of the next meeting will be announced by the executive committee.

Advisory Committee Views

The Economics Advisory Committee reported that crude oil production of 4,655,000 barrels daily in 1947 will be adequate to meet the estimate of demand, allowing for a slight increase in natural gasoline production, continuation of imports at recent levels of 400,000 barrels daily, and a net withdrawal on stocks of 30,000 barrels daily. This rate of production would be less than in 1946, but about the same as at present.

The committee reported that additions to stocks in 1946 "appear to have been more than needed for reasonable operations" and estimated that a net withdrawal of 10 million barrels in 1947 would place total stocks within reasonable levels. The committee further stated that the draft on product stocks should be larger to allow for some needed additions to crude oil stocks.

It was also cited that peak demands on the petroleum industry now occur in winter, and the margin by which winter demands exceed summer demands is increasing.

"It is reasonable to expect that in the future normal winter demands may exceed demands of the preceding summer by even more than the average margin of 184,000 barrels daily experienced in 1936-41," the committee said.

Crude Petroleum Situation

(Thousand Barrels Daily)

	Actual Year 1945	FORECAST 1946 4th Quarter	1946 Year	1947 1st Quarter	1947 Year
Supply:					
Crude Production	4,688	4,725	4,735	4,545	4,655
Natural Gasoline	313	320	317	330	340
Imports	310	400	380	400	400
Total Supply	5,311	5,445	5,432	5,275	5,395
Demand:					
Gasoline	2,151	2,060	2,110	1,910	2,200
Kerosine	224	310	265	325	270
Distillate	711	830	745	985	780
Residual	1,466	1,400	1,335	1,400	1,330
Others	796	818	828	700	845
Total Demand	5,348	5,418	5,283	5,320	5,425
Stock Changes:					
Gasoline	+30	+88	— 7	+160	— 4
Kerosine	— 2	—41	+19	—65	— 5
Distillate	— 7	—22	+66	—238	—31
Residual	—36	— 5	+45	—45	— 8
Other Products	—12	+11	+17	+55	— 4
Total Products	—27	+31	+140	—133	—52
Crude Oil	—10	— 4	+ 9	+88	+22
Total All Oils	—37	+27	+149	—45	—30
Closing Stocks (Millions):					
Gasoline	97.7	95	....	109.6	93.4
Kerosine	10.4	17.5	....	11.6	15.8
Distillate	35.8	60.0	....	38.7	48.7
Residual	37.2	53.5	....	49.4	50.6
4 Major Products	181.1	226.0	....	209.3	2 8.5
Others	63.7	70.0	....	75	68.8
Crude Oil	218.8	222.0	....	230	230
Total All Oils	463.6	518.0	....	514.3	507.3
Crude Runs to Stills	4,711	4,710	4,740	4,525	4,673

The shift to higher winter demands has been the result of the rapid growth in the use of petroleum for heating and the decrease in the seasonal fluctuations for gasoline as automobiles and roads have been improved. The significance of this development is that stable petroleum operations now necessitate net additions to stocks of all oils in summer and net withdrawals in winter.

The committee reported that demand in 1946 will be about 5,280,000 barrels daily while the supply will be 5,430,000 barrels daily. Additions to stocks of all oils are estimated to be 150,000 barrels daily or 54 million barrels for the year.

Exploration Trend

It was also reported that there has been an expansion of about 5 percent in exploratory activity in 1946 concurrent with the greater availability of materials and manpower and other economic changes.

"The most significant fact about demand this year is that it has remained within one percent of the wartime peak of 1945, in spite of considerable shifts in demands for various products," the committee said.

"The great decline in military requirements has been offset largely by additional civilian consumption. Demand this year is higher than in 1941 by about 900,000 barrels daily, or 20 percent.

"The addition to petroleum stocks during 1946 of 54 million barrels reflects principally increases of 25 million in distillate fuel oil, 16 million in residual fuel oil, and 7 million barrels in kerosine. Stocks of gasoline and crude oil will show relatively minor changes this year.

"The increase in stocks of products in 1946, particularly the rapid accumulation during the second and third quarters at a rate of about 250,000 barrels daily," the committee said, "naturally raised the question whether stocks were increasing unnecessarily and to such an extent as to lead to physical waste. Discussions of this subject are generally based on a comparison of stocks with a year ago or some previous year such as 1941.

"Two points should be kept in mind in connection with such discussions: 1) Comparisons with stocks in 1945 are distorted because of low stock levels that prevailed following the end of the war and the extensive refinery strikes in September and October, 1945, and 2) comparisons with stocks in prewar periods must take into account the substantial increase in demand that has occurred since then. Reasonable working stocks are related to the level of operations involved, and must increase as demand does, although the change in stocks is not necessarily in direct proportion to the change in demand.

"The committee has considered carefully the additions to stocks in 1946 because of the possible effect of such increases on waste. At the Compact Commission's request, it has prepared tentative and approximate estimates as to reasonable stock levels (see accompanying table). These estimates, intended only to indicate a range near which stocks may be considered reasonable, and subject to substantial modification by further study of the subject, are based on past relationships between demand and stocks and of experience during the war of levels at which difficulty was encountered in meeting demands even under government allocations.

Estimated Center of Reasonable Stock Range

(Million Barrels)

	Sept. 30, 1946	Sept. 30, 1947	Mar. 31, 1947
Gasoline	85	88	105
Kerosine	18	19	12
Distillate Fuel Oil	55	58	37
Residual Fuel Oil	54	57	50
Other Products	69	70	70
Refinable Crude Oil	225	230	230
Total	506	522	504

"The figures shown in the table are the committee's estimate at this time of the middle of the range, which may be easily three percent or a total of 15 million barrels on either side of the average, in which stocks may be considered reasonable, taking into account seasonal fluctuations and the upward trend in demand."

The committee pointed out that consideration of reasonable stocks should take into account the relation between available stocks, after deducting for oil in lines, tank bottoms, etc., and demand.

Gray DRILL PIPE RACKS

PROTECT tool joint threads on drill pipe.
PREVENT valves cutting out because of splinters in mud.
ELIMINATE hazards to men working on slippery derrick floor.

When you use GRAY Drill Pipe Racks, you enjoy these advantages:

1. Protect the threads from damage such as that frequently encountered in racking pipe on such hard materials as cable or chain, thereby lengthening tool joint life.
2. Eliminate chance of picking up splinters and other debris, thus avoiding the possibility of fouled core barrels, plugged bit eyes, and washed out tool joints.
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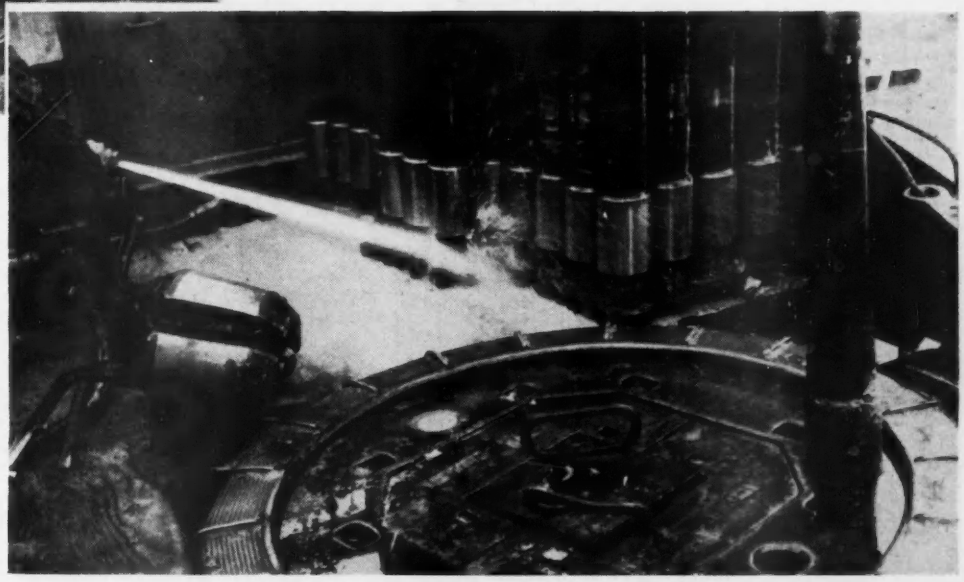

Gray Drill Pipe Racks are made in convenient sections to support 3 or 4 stands. Each section links with adjacent sections to form a row for any required number of stands. Full details upon request.

Seasonal Trends of Refinery Output, Product Stocks Extended Normally

Seasonal trends of refinery production and product stocks were extended normally during the week of December 7, according to The American Petroleum Institute.

Refinery output of fuel oils was increased considerably over the last week, while production of gasoline was cut back. Despite increased output of burning oils, stocks of these fuels were reduced over 3½ million barrels, reflecting stepped-up demand brought on by colder weather and the coal strike.

Crude production in U. S. fields averaged 4,695,000 barrels daily in the week of December 7, a drop of 100,000 daily from the previous week's rate, but 226,000 barrels or 5.1 percent more than that of the comparable week of last year.

The week's crude runs to stills increased 13,000 barrels a day over those of the previous week to average 4,720,000 daily. These daily runs exceeded those of last year's like period by 283,000 barrels or 6.4 percent.

Refinable crude stocks totaled 227,693,000 barrels on November 30, an increase of 2,574,000 from the week before and 8,848,000 barrels or 4 percent more than was held a year before. These stock figures were furnished by the Bureau of Mines.

Gasoline production, including refinery natural blends, declined 300,000 barrels from the previous week to total 14,845,000 barrels. This was 342,000 barrels or 2.4 percent more than was produced in the like period of last year. Stocks of finished and unfinished gasoline dropped 188,000 barrels during the week and ended the period at 88,183,000 barrels, which was 489,000 barrels more than was in storage a year before.

The week's refinery output of distillate fuel oil, which totaled 5,870,000 barrels, showed an advance of 612,000 barrels over the previous week and 1,326,000 barrels or 29.2 percent over the corresponding period of 1945. Stocks of this light fuel stood at 63,861,000 at the end of the week after being reduced 2,201,000 during the seven-day period.

Residual fuel production increased 175,000 barrels to 7,847,000 for the week, which was 891,000 barrels less than was made in last year's comparable period. Stocks of residual dropped 1,438,000 barrels during the week and totaled 57,209,000 barrels on December 7. This inventory was 13,130,000 barrels or 29.8 percent greater than a year ago.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1943	4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	4,762	9-30	4,798	12-30	240,992	1- 1	89,162	4- 1	48,162	10-28	64,744	10- 7
1945	4,944	7-21	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	[1]4,961	6-15	4,911	8-31	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 3
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-13
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-18	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	220,258	9- 9	76,302	1- 1	30,232	4-19	49,737	3-18
1945	3,621	10- 6	3,409	10-6	[4]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6

TRENDS OF 1946

Trends in Week Ended	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,293	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,447
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 2	4,759	4,769	221,870	14,594	85,930	5,371	65,943	7,434	61,636
November 9	4,779	4,714	221,302	15,001	86,963	5,401	[1]67,286	7,503	61,340
November 16	4,792	4,716	221,670	14,682	88,007	5,555	67,221	7,644	60,552
November 23	4,810	4,621	225,119	15,014	87,446	5,609	66,543	7,838	60,065
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
Dec. 7, 1946	4,695	4,720	.....	14,845	88,183	5,870	63,861	7,847	57,209
Dec. 8, 1945	4,469	4,437	[5]218,845	14,503	87,694	4,544	42,560	8,738	44,079
Change:									
In Week	—100	+13	+2,574	—300	—188	+612	—2,201	+175	—1,438
In Year	+226	+283	+8,848	+342	+498	+1,326	+21,301	—891	+13,130
In Year	+5.1%	+6.4%	+4.0%	+2.4%	+0.6%	+29.2%	+50.0%	—10.2%	+29.8%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, December 1, 1945.

Prices of Heating Oils and Gasoline Hiked In Many Areas

Prices for gasoline and heating oils have been hiked in many areas, as demand for motor fuel remains particularly high for this time of the year and calls for heating oils increase daily.

The recent 14-cent per barrel increase for Pennsylvania grade crude, which was initiated by The South Penn Oil Company, has been met by most of the large purchasers in that region.

Prices for gasoline, kerosine and distillates were at .2- to .5-cent higher levels at north Atlantic points, and Standard Oil Company of Kentucky announced it had advanced prices for gasoline, kerosine and diesel fuel throughout the South Atlantic area. These Standard Oil increases range from .3 to .35 cent for Crown gasoline and kerosine in tank wagon lots, while tank car price hikes were, .35-cent for Ethyl and regular-grade gasoline; .4 cent for kerosine, and .45 for diesel fuel oil. However, later reports indicate that increases in No. 2 and diesel fuel were being wiped out at some South Atlantic points by competitive price cutting.

A Western Pennsylvania refiner boosted his regular-grade and kerosine prices .25 cent, while several refiners in Arkansas and Oklahoma raised kerosine, diesel and distillate fuel prices .125 cent. Several Kansas refiners reported .125 to .3 cent advances in gasoline and kerosine prices.

Continental Oil Company announced a .5 cent per gallon raise in its tank wagon prices for diesel, Nos. 1 and 2, and tractor fuels in Montana, Wyoming, Colorado, and New Mexico, effective December 10.

Following South Penn's lead in increasing Pennsylvania grade crude postings were The Pennzoil Company, Quaker State Oil Refining Corporation, Cities Service Oil Company, Valvoline Pipe Lines, United Refining Company, Elk Refining Company, Tide Water Associated Oil Company, and The Pure Oil Company.

The new Pennsylvania price postings are Alleghany and Bradford district oil, $3.55; Southwest Pennsylvania, $3.54; Buckeye, $3.30; Middle District, $3.42; Southeastern Ohio, $3.30, and Zanesville, Ohio, $3.00. These prices do not include the Federal subsidy payments.

☆ Oklahoma

Garvin County Pool Opened Lincoln County Strike Likely

Oil pool opened in Galvin County; prospective pool opener in Lincoln County gets free oil on test; shallow gas pool opened near Oologah; Soldier Creek field defined on east; well abandoned as dry now making distillate and gas; Link Oil gets 400-barrel well in Muskogee County.

Garvin County: A deep oil pool has been opened by Max Pray and R. L. Bauman with Martin-Rose 1, CNE NE 1-4n-4w, 2 miles northeast of Lindsay Townsite. The well tested an average of 100 barrels of fluid per hour through casing, with tubing in the hole, from open hole in the Bromide sand zone, 9918-10,250 feet. The oil, which tested 42.3-gravity, was cut slightly with mud and wash water. No estimate was made of the amount of natural gas. The Rose was drilled to 10,180 feet, where electrical log was run, and the casing was set at 9918 feet. When the plug was drilled the hole was carried to 10,318 feet, where salt water was found. The hole was then plugged back to 10,250 feet. On later test the well averaged 100 barrels of oil per hour. It has been shut in for installation of additional tankage. The wildcat is on an 80-acre farmout from Magnolia Petroleum Company.

Lincoln County: From present indications, Danciger Oil & Refining Company and Mercury Drilling Company will open an oil pool in the Wilcox sand zone northwest of the Laffoon pool. Shaffner 1, CNE SE 7-13n-6e, topped the Wilcox at 4405 feet, and on a drill-stem test from 4405-40 feet, gas and a considerable amount of free oil were recovered. Casing was set at 4400 feet and testing will continue. The test is near the Sac and Fox pools.

Rogers County: A shallow gas field has been opened by R. H. Lent, near Oologah. Test 1, SE SE SW 21-23n-15e, made an estimated 1½ million cubic feet of gas at a depth of 705 feet in sandy lime, and has been shut in, pending completion. Lent is now moving in for a test on the northwest corner of the Oologah townsite, which is a part of the original lease block.

Cotton County: Dry holes, which are on the increase in the county, have found their way into the productive Soldier Creek pool in 3s-11w. The east side of the pool has been defined by S. D. Johnson et al's Dugan 1, SW SW 3-3s-11w. Dugan was drilled to 1618 feet to the pay, where it got only a slight show of oil and some water. It has been abandoned as dry.

Antioch Area: Distillate and gas production were found in a well that had been abandoned in July as a dry hole. The well, taken over by The Carter Oil Company and associates, is Hart 1, SE SE SE 23-3n-3w. Seventy feet of green distillate and 290 feet of distillate-cut mud were recovered on a drill-stem test from 7197-222 feet. While tool was being broken down the well blew gas and distillate at a rate estimated at 4 million cubic feet of gas, and eight barrels of distillate per hour. The test was taken over from Mid-Continent Petroleum Corporation.

Muskogee County: A 400-barrel oil well has been brought in by Link Oil Company, in the old Link area, just across the line from Okmulgee County. The well, King 10, SW NE SE 30-15n-15e, fourth drilled on the company's lease, found the pay sand at 1578-87 feet, and is flowing an estimated 400 barrels of oil per day. The pay is believed the Boynton sand, but it has not been called by company geologists. All wells in the vicinity are relatively small producers.

Caddo County: The Superior Oil Company of California's Weller 51-11, NW NW NE 11-8n-12w, 5 miles north of Fort Cobb, is drilling below 16,020 feet. It is the deepest hole ever drilled in the state.

The hole is reported in good condition and operators have not indicated when they will quit. The company is not releasing geological information, but it is thought that the Pennsylvanian was based at about 16,000 feet.

Gas Course Set

The 1947 Southwestern Gas Measurement Short Course will be at the University of Oklahoma in Norman May 6-8, it was decided by the General Committee. Next meeting of the Committee will be held in Oklahoma City, January 13.

☆ Kansas

Barber County Pool Opened; Ellis Well Has Oil on Test

Barber County wildcat opens field; Ellis County well looms as oil pool opener; Rooks County well makes maximum potential of 3000 barrels; Harvey County may get new oil pool.

Barber County: Continental Oil Company's Smith 1, NW NW NW 21-33s-12w, east of Medicine Lodge pool, opened a new pool. The well is flowing an estimated 50 barrels of 27-gravity oil an hour, with gas rated at 1 million feet a day. Production is from the Simpson formation at 4857-4895 feet. Continental, in partnership with Kennecott Copper Corporation, holds a block of 2758 acres in the area.

Ellis County: More than 1000 feet of oil was recovered on a drill-stem test in the Lansing lime at Stanolind Oil & Gas Company's Irvin 1, wildcat in SE SE SE 6-14s-19w. The test, made from 3553-63 feet, also showed 30 feet of mud. Operators are drilling below 3695 feet, near the base of the Lansing, and will completely penetrate that formation before further testing of the prospective pool opener.

Rooks County: A 3000-barrel maximum potential has been made by H. H. & B. Drilling Company's Cabbage 1,

Wells Completed in United States in Week Ended December 7, 1946

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS *Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	This Week 1945
Alabama	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Arkansas	...	...	...	...	2	2	1	1	...	...	...	1	4	5	5
California	31	...	2	...	1	34	3	...	...	...	3	3	40	33	37
Colorado	9	...	...	...	...	9	...	1	...	...	...	1	10	5	2
Illinois	15	...	...	...	13	28	...	...	...	...	5	5	33	44	37
Indiana	5	...	...	...	4	9	...	...	...	...	2	2	11	7	...
Kansas	25	...	15	...	11	51	...	...	...	...	2	2	53	33	40
Kentucky	7	...	1	...	3	11	...	...	...	...	1	1	12	11	...
Louisiana	16	1	1	...	6	24	...	...	2	...	4	6	30	9	25
N. Louisiana	8	...	1	...	3	12	...	...	...	...	2	2	14	4	15
S. Louisiana	8	1	...	...	3	12	...	...	2	...	2	4	16	5	10
Michigan	3	...	...	...	1	4	...	1	...	...	2	3	7	12	21
Mississippi	5	...	...	...	...	5	...	...	...	...	7	7	12	6	3
Montana	...	...	...	...	...	...	...	1	...	...	1	2	2	2	2
New Mexico	9	...	...	...	...	9	...	...	...	...	...	...	9	10	8
New York	14	...	...	9	...	23	...	...	...	...	...	...	23	26	29
Ohio	4	...	15	...	4	23	1	...	1	...	1	2	26	28	8
Oklahoma	39	...	...	2	7	48	3	...	...	...	18	18	69	54	46
Pennsylvania	28	...	6	15	2	51	...	...	...	...	...	...	51	53	42
Douth Dakota	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...
Texas	77	...	8	...	19	104	3	6	1	...	22	29	136	172	149
E. Tex. Bor. Co.'s	2	...	3	...	...	5	...	...	...	...	...	...	5	2	1
Rest of E. Tex.	3	...	...	...	2	5	...	2	...	...	3	5	10	9	3
North Texas	16	...	...	...	5	21	2	2	...	...	4	6	29	47	60
W. Central Tex.	5	...	...	...	1	6	...	...	...	...	4	4	10	10	4
West Texas	27	...	...	...	3	30	1	...	...	...	3	3	34	41	27
Texas Panhandle	3	...	2	...	1	6	...	...	...	...	...	...	6	6	9
G. Coast, Upper.	2	...	...	...	4	6	...	...	...	...	4	4	10	17	15
G. Coast, Lower.	12	...	2	...	1	15	...	2	1	...	2	5	20	23	24
Southwest Texas	3	...	...	...	2	5	...	...	...	...	1	1	6	11	5
S. Central Tex.	4	...	1	...	...	5	...	...	...	...	1	1	6	6	1
West Virginia	6	...	7	...	2	15	...	...	...	...	...	...	15	17	19
Wyoming	3	...	1	...	...	4	...	...	...	...	...	...	4	3	5
Total U.S.	296	1	56	26	75	454	11	10	4	...	69	83	548	532	478

* Includes salt water disposal wells.

SW SW 7-9s-18w. The well, in the new Barry Southeast pool, is producing from the Arbuckle lime at total depth of 3505 feet. It is a northeast offset to the discovery well of the field, the company's Hilgers 1, which made a 2735-barrel depthograph potential on state test in October. The Cabbage made its potential by echometer test.

Harvey County: Stanolind appears to be opening an oil pool with Brandenberger 1, SW NE NW 12-24s-3w. The Brandenberger, situated 6 miles east of the Burton pool, recovered 600 feet of oil on a drill-stem test in the Viola lime from 3872-90 feet. Operators are trying to exhaust salt water which accompanied the oil. The Viola lime was topped at 3873 feet, with total depth of the well 3925 feet.

Harper Lease Sold

Sale of the Harry Harper oil lease in the Falls City oil field, Richardson County, Nebraska, to John Peters and associates of the Salem Refinery has been announced. The lease, 80 acres in area on which six wells were drilled, has produced several hundred thousand barrels of crude. After six years it is still producing up to 40 to 50 barrels of crude per day from the Hunton lime. Peters et al hope to increase production to around 100 barrels per day. The lease is in SE SW 20-1n-16e.

Personnel Changes in Humble Production Department Made

Four changes in Humble Oil & Refining Company's Production Department supervisory forces were announced in Houston.

C. G. Swank, assistant district superintendent, Conroe District, Conroe, Texas, was transferred to the Thompsons District, Thompsons, Texas, as acting district superintendent.

W. W. Thames, farm boss, Anahuac District, Monroe City, Texas, was transferred to the Conroe District as assistant district superintendent.

A. R. Bruce, farm boss, Tomball District, Tomball, Texas, was promoted to assistant district superintendent at Tomball.

A. J. Mangum, senior gas engineer, Katy gas cycling plant, Katy, Texas, was promoted to assistant cycling plant superintendent.

Engineers Elect

Dr. E. E. Rosaire, Houston geophysicist, was installed as president of the San Jacinto Chapter of the Texas Society of Professional Engineers, succeeding Dr. L. W. Blau, research consultant of Humble Oil & Refining Company. Other officers installed were W. B. Rawson, vice president of Maintenance Engineering Company, as first vice president; L. J. Neuman, of L. J. Neuman Company, second vice president; and Noah Hull, chief engineer for Hughes Tool Company, secretary. New directors elected were R. H. Peters, Southwestern Bell Telephone Company district engineer; Olin G. Bell, Humble Oil & Refining Company; W. S. Scarborough, Reed Roller Bit Company; and John H. Bringhurst, chief of engineers of American Petroleum Company. C. G. Kirkbride, of the chemical engineering department of Texas A. & M. College showed color movies of the atom bomb test at Bikini.

☆ West Texas

Midland County Test Shows For Devonian Production

Production from Devonian showing at Midland County semiwildcat; Andector field defined to north and extended south; Coke County discovery yields sweetest crude in district; Ellenburger producing sector of Fullerton field confirmed for Devonian production.

Midland County: Humble Oil & Refining Company's Turner 1, 2 miles south by east of its Midland field 10,300-foot Strawn discovery plugged back from Ellenburger, developed sufficient gas volume to flow rotary mud and water cushion when tester was used in Devonian at 11,385-444 feet in lime and chert. Another drill-stem test was scheduled. This outpost passed up nominal volume of gas in the Strawn, topped at 10,306 feet, or 7 feet low, but gained structural position in deepening to the devonian.

Andector Field: Humble's Cowden 1-D, north offset to its Ellenburger discovery and in Andrews County, tested sulphur water in Ellenburger at 8827-65 feet and in the Basal Permian at 7657-7775 feet when plugged back. An attempt will be made to complete in the San Andres. The company's Cowden 1-F, ½ mile south of the discovery and in Ector County, flowed 980 barrels, with gas-oil ratio of 545/1, natural through ½-inch choke from perforations at 8585-8655 feet in Ellenburger, topped at 8566 feet, or 27 feet low. Humble's Cowden 1-E, east offset to the discovery, and about 100 feet low, was swabbing 1 to 2 barrels of oil hourly from perforations at 8650-60 feet. It is due to be perforated higher to try for natural flow.

Deep Prospects: Phillips Petroleum Company's University 1-B, 1½ miles southeast of Pyote, Ward County, was drilling shale at 11,538 feet. In Crockett County, Loffland Bros. Cox 1 entered barren Ellenburger at 10,260 feet, and was drilling dolomite at 10,840 feet. Humble's Sawyer Cattle Company 1-C, Reagan County, was eliminated as an Ordovician prospect in testing salt water from Ellenburger dolomite at 9918-60 feet.

Coke County: Sun Oil Company's Jameson 1, 27½ miles southeast of the Westbrook field, oldest in the district and nearest active area, was temporarily shut in after gauging 102 barrels of 45-gravity oil natural through ¼-inch choke on 24-hour test, with 180 pounds flowing pressure on tubing and 700 pounds on casing. Production is from open hole at 6225-45 feet in Crinoidal (Pennsylvanian), topped at 6200 feet, with gas-oil contact at 6225 feet. Sun has contracted to sell the production from its large supporting lease block until a direct pipe line connection is available to the Scurlock Oil Company, which will currently pay $1.60 per barrel at the well, and load into tank cars at Bronte. This Crinoidal oil is exceptionally sweet, as sample analysis shows only .04 percent sulphur and .002 percent salt content. The gasoline has an octane rating of 69.7.

Sun is starting Fred Jameson 1, ¼ mile south of its discovery, and will drill to the Ellenburger, the objective of the original test. If deeper production occurs, development will be accelerated as well as the entry of a direct pipe line outlet. Completions in the Crinoidal zone will cost about $60,000 each. The company apparently controls the productive area.

Andrews County: Texas Pacific Coal & Oil Company's Jackson 14-E, southeast offset to Ellenburger production in the Fullerton field, confirmed Devonian production for the area in recovering 3300 feet of oil at 8090-8195 feet. The Devonian was entered at 8125 feet. A drill-stem test was pending at 8205-8380 feet, but completion will be made in the Ellenburger.

Royal Oil & Gas Company's Lotus 1, C SE SW PSL 18, Block A-48, 1½ miles west of the South Fullerton 2-pay area, was drilling at 7750 feet to explore the Devonian. The Glorietta was entered at 5680 feet and Fullerton at 6880 feet, correlating 34 feet low and 33 feet low, respectively to Mid-Continent's Lotus 1, Devonian producer, but drill-stem test at 7017-7116 feet proved dry. This outpost establishes flattening of the Clear Fork structure to the west.

Sinclair Prairie's Universiy 2-160, southeast outpost for the South Fullerton-Devonian 14-well area, flowed 232 barrels of 44-gravity oil, with gas-oil ratio of 892-1, on 6-hour natural test through ½-inch choke from Devonian at 8790.

☆ West Central Texas

Callahan County Has Possible New Pay Strike in Old Pool

Callahan County has prospective Ellenburger discovery within an old shallow pool; Eskota field outpost is failure in Palo Pinto, but shallow production probable.

Callahan County: E. E. Fogelson and M. S. Ingleright's Baum-Swafford 1, G. M. Vidal Survey 798, offsetting shallow pumpers in the old Baum pool, was installing machine to drill plugs from 5½-inch pipe set on top of Ellenburger pay, entered at 3838 feet with elevation 1773 feet. Oil saturation was drilled to 3858 feet, and a drill-stem test of the section yielded gas to surface within 4 minutes. The recovery consisted of 260 feet of oil and 140 feet of oil-cut mud, with bottom-hole pressure building up to 1500 pounds within 15 minutes. Owners have a supporting block of 2000 acres, and have moved rotary 2½ miles east to drill Brigham Young 1, situated on a similar-sized block also obtained from Paul and David Dean.

Fisher County: Skelly Oil Company's Pike Hall 1, a mile south of its Eskota 3-well Palo Pinto lime reef area, entered the Palo Pinto lime reef at 4498 feet, with elevation 1859 feet, but this zone proved barren in drilling to 4783 feet. This outpost was plugged back to 2815 feet to set pipe at 2768 feet to try for completion from a promising oil show at 2798-2817 feet and also at 2620-32 feet in Noddle Creek, topped at 2600 feet.

Petroleum Heat, Power Firm To Take Over Taylor Refining

Stockholders of Petroleum Heat & Power Company will meet December 23 to authorize the issuance of 1 million additional shares of common stock, 912,464

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of which will be exchanged for the entire capital stock of Taylor Refining Company, Taylor, Texas, owner of a modern refinery of 25,000 barrels per day capacity located in Corpus Christi, Texas.

Taylor Refining is also engaged in the production of crude oil and natural gas with leases in Duval and Victoria Counties, Texas, and has a 50 percent interest in Coastal Refineries, Inc., which owns and operates a refinery at Port Isabel and is engaged in the production and sale of crude oil and natural gas in Starr and Hidalgo Counties, Texas.

☆ North Texas

Discovery Rate High in Clay And Wilbarger Counties

Discovery rate high in Clay and Wilbarger counties; Haskell County's first Strawn discovery given official gauge; Second Ellenburger well in Madden field has large output; Foard County wildcat shows promise of discovery in Strawn.

Haskell County: Tom D. Humphrey's Chapman 1, H. Tidwell Survey 60 and 3 miles northeast of the Lawson field, recorded the first Strawn production for the county in pumping and flowing 469 barrels of oil, plus 8 percent water, after acidizing perforations at 4070-82 feet. This discovery passed up probable production in the 2500-foot Canyon, and was drilled to barren Mississippian at 5470 feet. Humphrey's Chapman 2, northeast twin, missed the 2500-foot pay, then made an unsuccessful try for production in the 4200-foot Strawn sand, which showed oil in the discovery. The second test was abandoned at 4284 feet since close spacing prohibits completion in the 4000-foot discovery lime. The area is to be known as the Humphrey-Chapman field.

Humphrey's Burnett 1, Subdivision 2, J. Campbell Survey, a wildcat, was abandoned at 2808 feet after logging a nominal oil show in the Canyon reef, topped at 2770 feet with elevation of 1470 feet. Drilling is under way on Burnett 2, a short distance southwest of the failure.

Foard County: Stanolind Oil & Gas Company's Halsell 1, John Shearer Survey and on a 3368-acre lease, developed a fair gas blow and recovered 80 feet of heavily oil- and gas-cut mud when tester was used in Strawn lime, carrying broken saturation and porosity, at 4822-42 feet. This showing is ample to warrant setting pipe for a completion try after the wildcat is deepened to the Ellenburger. The Canyon was entered at 3573 feet, with lime reef at 3754 feet, and oolitic lime section of the Strawn at 4617 feet. Elevation is 1416 feet.

Wilbarger County: Paradise Oil Company's Waggoner Estate 1-I, SE SE H&TC Railway 11, Block 14, and 1¾ miles north by east of shallower production, established a new Canyon lime pool in flowing 480 barrels of 38-gravity oil, with gas-oil ratio 600/1, natural through ⅜-inch choke, having plugged back from barren Ellenburger at 4780-4964 feet. Production is from perforations at 3139-55 feet. Top of the Canyon was called at 3093 feet, with elevation 1154 feet. Rig has been skidded for a west offset. Failures west and north tend to localize the productive area. This is the fourth Canyon discovery for the county within 5 months.

Clay County: Continental Oil Company and Edge Oil Company's Scott 1, 1⅛ miles southeast of the Buffalo Springs discovery pumper in the Simpson, was preparing to deepen after a disappointing showing from saturation at 6495-6515 feet in Ellenburger, topped at 6479 feet, or 122 feet higher. This wildcat swabbed 61 barrels of oil and 22 barrels of acid residue on 24-hour test after 2-stage treatment with 7000 gallons of acid.

R. C. Lipscomb et al's Hapgood 1-A, northwest corner of Block 78, Marion County School Lands and 1½ miles west of the Worsham sector of the Ringgold uplift, was running pipe to try for completion after recovering 800 feet of oil and 100 feet of oil-cut mud when tester was used in the Strawn sand at 4975-5002 feet. This prospective discovery area is a good bet for Bend production below. Jack Grace et al's Edwards 1-B, southeast offset to a recent prolific strike on the west flank of the uplift, flowed 1848 barrels of 45-gravity oil, with gas-oil ratio 500/1, natural through 1-inch choke from conglomerate at 6061-80 feet in Bend, topped at 5908 feet, or 4 feet low. This confirmation will passed up commercial pumper output from the 5500-foot Strawn.

Wichita County: Wayne H. Hammon and Warren Petroleum Corporation's Parker 4, second Ordovician producer for Madden field, flowed 2055 barrels of 43-gravity oil initial through 30/64-inch choke from saturation at 5235-50 feet in Ellenburger, topped at 5235 feet, or 10 feet high. Previously drilled deep failures will localize this new pay area.

West Coast Personnel Changes Made by Shell Oil Company

S. F. Bowlby, vice president, Los Angeles management of Shell Oil Company, has announced the following staff transfers and promotions:

E. W. Masters, who has been on special assignment in New York, will return shortly to resume his duties as production manager for the Pacific Coast territory.

R. C. McCurdy, division manager of the San Joaquin Valley Division, will become manager at Maracaibo, Venezuela.

Paul L. Kartzke, senior exploitation engineer at Los Angeles, will become division manager of the San Joaquin Valley Division.

W. C. Chonette, division manager, Shell Oil Company of Canada, becomes chief exploitation engineer at Los Angeles.

Paul E. Lehr, division superintendent, San Joaquin Valley Division, will become general production superintendent, Los Angeles.

Ammonia Line Promised

The Bureau of Mines has been assured by the War Department the use of at least one of the five synthetic ammonia lines in the Missouri Ordnance Works, Louisiana, Mo., by January 1, 1948, to carry out hydrogenation work of the Bureau's synthetic liquid fuels program. Prospects are bright for early renewal of demonstration plant construction activity at the Missouri works which was interrupted when the War Department decided to use the facility for fertilizer production.

☆ East Texas

Quitman Field, Wood County Has Promise of Deeper Pay

Quitman field has promise of third and deeper oil pay; Smith County wildcat flowing into pits from 11 feet of Paluxy sand; Sand Flat field expanded southwest.

Wood County: Shell Oil Company's Goldsmith 12, E. Goodsir Survey, and adjacent to Sub-Clarksville and Paluxy wells in the Quitman field, showed porosity and oil stain in the Rodessa at 7905-30 feet. Protection string of 9 5/8-inch casing was cemented at 7924 feet without making a drill-stem test because of carrying open hole below surface pipe at 794 feet. Large pipe was used to be prepared to continue to the Smackover, the original objective. Base of the Massive Anhydrite was called at 7720 feet, with elevation of 428 feet.

Amerada Petroleum Corporation's Coke Unit 2, Smackover test for the coke field, was drilling hard Travis Peak at 9191 feet, averaging only 20 feet of new hole daily. Humble Oil & Refining Company's McKnight 1, northeast edge of the Hawkins field and a Smackover project, was drilling dry Travis Peak at 10,165 feet.

Haynes B. Ownby, Trustee's Harry 1, J. Swift Survey and 3½ miles southwest of Quitman, was drilling shale at 4960 feet.

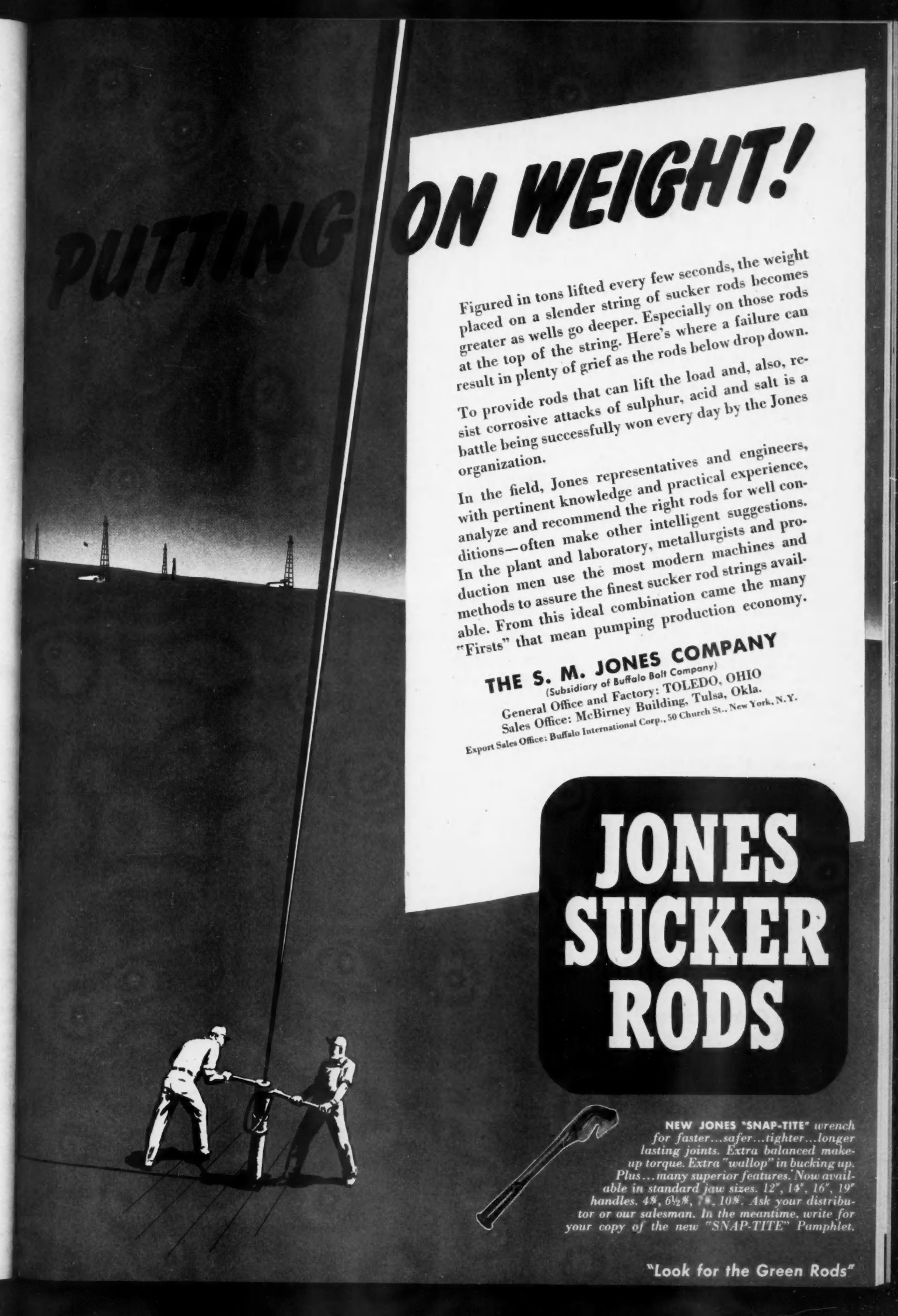
Smith County: Delta Drilling Company's Boynton-Magnolia 1, J. J. Smith Survey and 2 miles east by north of the Mount Sylvan 2-well pool, confirmed its favorable drill-stem test by flowing 34-gravity oil into pits while cleaning itself of rotary fluid. The production is from perforations at 7512-28 feet in the Paluxy, topped at 7409 feet with elevation of 528 feet. The effective pay sand is at 7516-27 feet, according to electrical formation survey, while first water was entered at 7611 feet. Top of the Paluxy correlates 43 feet low to the Mount Sylvan discovery, while the top of the oil correlates 103 feet low. The new producer is 115 feet lower on the water table. Four failures have been drilled on the Mount Sylvan prospect including an east offset, which serves as the basis for temporarily classifying Delta's strike as a separate structure.

Humble's Owen 1, Daniel Minor Survey and ½ mile southwest of Paluxy production in the Sand Flat field, pumped 121 barrels of oil initial from Paluxy perforations at 7164-84 feet. This outpost is 1255 feet southeast of Sun Oil Company's Patterson 1, pumper in the 9300-foot Rodessa.

Cherokee County: Standard Oil Company of Texas' New Birmingham 1, 10 miles southeast of the Boggy Creek field, was drilling at 9790 feet in Barren Travis Peak, topped at 9508 feet.

Freestone County: The Texas Company's White 1, West outpost for the Fairfield gas-distillate field, was fishing at 12,710 feet in Buckner, topped at 12,546 feet, according to preliminary formation call.

Harrison County: Placid Oil Company-Gulf Oil Corporation's Dunn 2, S. B. Simpson Survey, 2 miles northwest of Harleton and 3700 feet north and slightly west of Placid's Dunn 1, previous 1-mile west extention to the Whelan



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gas-distillate field, was completed from the Rodessa at 6890-6902 feet, flowing 12½ million cubic feet of gas daily on open flow. Travis Peak showed for non-commercial gas production at 7997 feet, and operators plugged back.

Stanolind Oil & Gas Company has staked a long awaited Cotton Valley-Smackover lime wildcat, George Saughter 1, nwc 166.6-acre lease in the J. E. White Survey, 9 miles north of Marshall. It is scheduled to 10,200 feet, believed deep enough to test the Smackover.

☆ Southwest Texas

New Oil Field Discovery in Starr County Is Put on Pump

Oil field discovery in Starr County placed on pump; wildcat a mile north of La Reforma field tests condensate and oil.

Starr County: Tarver & Staggs Company's Loreto Canales 1, discovery well in the northwestern part of the county, 23 miles northwest of Roma and 11 miles northwest of El Sauz in the Sacatosa Grant, has been put on the pump for a production test. An estimated 20 barrels of 42-gravity oil per day were swabbed from perforated liner at 1707-14 feet. A small amount of salt water showed up in the initial recovery. Total depth is 1715 feet. Production resulted from deepening the well after it has been initially drilled by George R. Boyles to 1620 feet. Boyles is reported to have reached the pay level in Antonio Canales 1, about 900 feet northwest of the discovery well.

Sun Oil Company's de Lopez 1-A, a mile northwest of the La Reforma field, is running tests below 6900 feet, with no details reported. The well tested gas-condensate at 6023-33 feet while slight oil shows under little pressure were encountered at 6050-63 and 6072-88 feet. At 6089-98 feet the well produced salt water.

Engineers Near Participation In New World Conference

Participation of the principal American engineering societies in the World Engineering Conference, formed in Paris last September, is a step nearer actuality with the plans for setting up a national committee to contact the various member groups of the Engineers Joint Council.

Not more than three delegates will represent each participating nation, with the intent to tie in with other branches of the United Nations Educational, Scientific and Cultural Organization phases having to do with engineering. Stewart E. Reimel, 29 West 39th Street, New York City, is secretary of the committee in charge.

Pollution Order Expected

Oil companies operating in Louisiana's coastal parishes will be ordered to cease the discharge of oil, brine and other wastes into the waters of these parishes, including coastal waters within the three-mile limit, according to Louisiana's Stream Control Commission. The Commission made the announcement after hearing complaints from representatives of the state's fishing industry, who charged that stream pollution from oil field operations had already damaged oyster beds to the extent of $6 million.

☆ South Central Texas

West Jourdanton Extension Area Wells Drilled by Majors

Humble and Magnolia drill in West Jourdanton extension area; Luling field outpost goes on pump; Zavala County wildcat bails oil.

Atascosa County: Two new wells are now drilling in the West Jourdanton extension area where Humble Oil & Refining Company brought in production last July with Sandeen 1. Magnolia Petroleum Company has offset the Sandeen well with Nixon & Steinle 1, 1400 feet southwest of the producer. Magnolia was drilling at 4363 feet. The second active test in the area is Humble's S.P.J.S.A. Lodge 1, 1⅛ miles west of the Jourdanton field in the James P. Gorman Survey 1189.

Guadalupe County: Weigand Well Serving Company's L. A. Anderson 1, wildcat ½ mile southwest of the Luling field and in the Harriet Cottle Survey 14, has been put on pump after acidizing with 4000 gallons at 1850-2050 feet from which zone the well flowed 2½ barrels of oil and 50 percent salt water daily.

Zavala County: The Texas Company's Northeast Farming Company 1, wildcat 6 miles northwest of Crystal City and in Pedro Jose de Aguirre Grant A-2, was bailing oil from the hole bottomed at 3372 feet. Gas sands were cored at 3303-72 feet after setting 7-inch casing at 3300 feet.

☆ Lower Texas Coast

New Oil Field Indicated by Wildcat in Hidalgo County

New oil field indicated in Hidalgo County wildcat; oil and salt water recovered from George West area wildcat.

Hidalgo County: Rogers Lacy's Fee 1, wildcat 1 mile west of the Cameron County line and 6 miles northeast of Mercedes, flowed an undisclosed amount of 30.7-gravity oil on ¼-inch choke on production test from perforations at 7983-92 feet to indicate a new oil field for the area. The well was last reported being squeezed prior to final completion. Total depth is 10,713 feet with 5½-inch casing set to about 8000 feet.

Live Oak County: Smith-Story-Wood Corporation's E. W. McWorter 1, wildcat 6 miles southeast of George West. flowed 10 barrels of 41-gravity oil and an equal volume of salt water daily on ⅛-inch choke from perforations at 4112-14½ feet. Shutin pressure is 1325 pounds. Drilled to 4200 feet, the well has casing set to 4122 feet. Initial production tests in the Pettus sands at 4112-16 feet produced oil and salt water but it was necessary to swab the hole.

☆ Upper Texas Coast

Humble Completes Outpost Producer at Red Fish Reef

Humble completes outpost producer at Red Fish Reef; casing leak delays tests in Olive field outpost; Livingston field extension try abandoned; East Altair wildcat has slight condensate show.

Chambers County: Humble Oil & Refining Company officially completed State 37-A, south outpost in Sect. 264 of the Red Fish Reef field, Galveston Bay, for an initial gauge of 165 barrels of 38-gravity oil per day through ⅛-inch choke from 36 perforations at 8682-70 feet. Gas-oil ratio was calculated at 570/1 and tubing pressure gauged 1025 pounds. Total depth is 10,950 feet to which depth 5½-inch casing was set.

Hardin County: Pan American Production Company's Olive Sternenberg Lumber Company 1-B, north outpost in the Olive field area, was delayed in production tests by a casing leak at 3150 feet. Former tests in high-pressure, low-capacity gas sands through perforations at 12,800-856 feet and from open hole at 12,858-946 feet failed to recover any flow. New deep tests will be made in stringer sands between the 12,700-800-foot zone.

Polk County: Attempts to extend production approximately 4000 feet north in the Livingston field were abandoned by Humble when J. C. Whittfoth et al 2 failed to make shows in the Wilcox or Sparta formations. Bottomed at 7141 feet, the well is 4331 feet northeast of the No. 1 dry hole and 4000 feet from production on the north flank of the field.

Colorado County: Tide Water Associated Oil Company's Mrs. Ida Belle Brandon 1, wildcat in the northeast Altair area, G. W. Strawschneider Survey A-40, 10,500 feet from nearest production, made only minor shows to its total depth of 11,451 feet. Cores from 8875-9007 feet indicated salty sand and shale. Slight shows of condensate were made from 10,175-273 feet. The well has been plugged as dry.

To Test Tax Validity

A suit to test the validity of the 1-cent gasoline tax enacted by the 1945 Kansas Legislature and put into effect March 1 by proclamation of Governor Andrew B. Schoeppel, has been prepared by A. B. Mitchell, Kansas attorney general. The suit is to be filed in the Kansas Supreme Court in behalf of Mitchell's office, and by order of the governor. The tax is a non-exempt levy intended to match federal funds for secondary roads. The regular 3-cent tax exempts gasoline used for non-highway purposes.

☆ South Louisiana

Beauregard Parish New Pool Opener Is Given Flow Test

Barnsdall's new pool opener given flow test; new sand discovered at Bayou des Glaise; California Company having trouble completing Alliance field oil discovery.

Beauregard Parish: A discovery is Barnsdall Oil Company's Long Bell Lumber Company 1, 4 miles north of Gordon field in 1-6s-10w. On a drill-stem test of perforations in a Cockfield sand at 8236-53 feet a flow of 97 barrels of 49.3-gravity oil daily was gauged. Flow was through ¼ and 6/64-inch chokes with 1550 pounds flowing pressure and gas-oil ratio 1108/1. Testing tool has been pulled and tubing is now being run for production test. Total depth is 8430

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feet with 7-inch casing set on bottom. Testing operations were held up for several weeks in this field due to tubing and squeezing tool being accidentally cemented in the hole while making squeeze jobs at 8263-67 and 8224-28 feet.

Iberville Parish: Humble Oil & Refining Company's Schwing et al 2-B, Bayou des Glaise field, has discovered a new producing sand. Production is from perforations at 11,716-726 feet where on potential the well flowed 48 barrels of 55.3-gravity condensate and 2,041,000 cubic feet of gas daily through 10/64-inch choke. Flowing pressure was 4250 pounds. Total depth is 11,890 feet in sidetracked hole.

Plaquemines Parish: The California Company is having trouble completing Louisiana Citrus Lands Inc. 1, first oil well in the Alliance field discovered a short time ago by the same company's Brady 4, Unit 4. On a drill-stem test the Louisiana Citrus Lands 1 flowed at the rate of 207 barrels of 38.7-gravity oil daily but when tubing was run for production test it sanded up and operators have been unable to get a completion.

Texas Map Issued

The Bureau of Economic Geology of the University of Texas has announced the publication of the third edition of the Structural Map of Texas by E. H. Sellards and Leo Hendricks. The map is in color and shows oil and gas fields, faults, salt domes, and structural contours with a 500-foot interval on key stratographic horizons. Price for the complete map of four sheets is $5 (postage prepaid). Price for separate sheets is $1.50 each (postage prepaid).

☆ North Louisiana

Claiborne Parish's Lisbon Field Gets North Extension

Lisbon production extended 1 mile north; Catahoula Parish wildcat tests some oil and formation water; Caddo Parish wildcat has disappointing test.

Claiborne Parish: Hassie Hunt, Trustee's Fuller 1, 33-22n-4w, extended production 1 mile north of the Lisbon field. It completed as a Travis Peak oiler flowing 462 barrels of 35-gravity oil daily from 60 perforations at 5160-70 feet. Total depth was 7914 feet where 5½-inch pipe was cemented. Previous perforations of the Bodcaw at 7806-26 feet which tested gas were shut off, though the possibility remains of a dual completion.

Catahoula Parish: Lyons & Prentiss-Penrod Drilling Company's P. L. Mitchell 1, C NW NW 36-8n-7e, 4 miles south of Riverfield, when perforated at 9330-34 feet, flowed about 6 barrels of fluid per hour, of which 20 percent is oil and the rest formation water. Operators will continue to test. Total depth is 9471 feet.

Caddo Parish: N. A. Hendrickson et al's Muslow 1, drilled to test formations below shallow production sands of Pine Island field, reportedly tested salt water with test bottomed at 7338 feet.

Brundred Moves Offices

Brundred Oil Corporation has moved its Kansas division office from 215 Bennett Building, Ottawa, Kansas, to Suite 244, Plaza Hall Building, 4722 Broadway, Kansas City 2. B. F. Brundred and L. L. Brundred are vice presidents in charge of the Kansas division.

Nomenclature Group to Meet

The annual meeting of the Standing Committee on Oil Field Nomenclature of the Kansas-Oklahoma Division, Mid-Continent Oil & Gas Association, will be held in Tulsa December 20. A review of the procedures utilized by the Oklahoma Steering Committee on Oil Field Names and the Kansas Steering Committee in making their recommendations and determinations will be given.

☆ Arkansas

Ashley Wildcat to Be Tested; Columbia Test Is Deepened

Ashley County wildcat preparing for drill-stem test; recompletion of old Magnolia field producer gets good well; Columbia wildcat strike completed on pump.

Ashley County: Albert Plummer's Crossett 1, NE NE 25-17s-6w, 7 miles east and south of Hamburg, will run a drill-stem test of sand just below the gas-rock from 3294-3320 feet. The wildcat will be plugged back from 4547 feet to test. Gas Rock was topped at 2874 feet.

Columbia County: The Atlantic Refining Company deepened a depleted producer in the Magnolia field, Johnson-Brown A-1, C NE NW 22-17s-20w, which was first completed by Southwood Oil Company in 1939 as an oiler at 7625. Recompletion of the well in the Smackover has made a producer flowing 140 barrels of 38.7-gravity oil daily through 10/64-inch choke on tubing, with gas-oil ratio 854/1. New total depth is 7625 feet. Casing was perforated with 20 shots from 7596-7614 feet. This completion will likely lead to deeper drilling all through the area.

McAlester Fuel Oil Company's R. A. Wynn, wildcat test, 5 miles northeast of McNeil and 4 miles south of Stephens, which was completed around 3500 feet in the Pettit zone, went on the pump for an estimated 50 or more barrels daily of 35-gravity oil. The test is reported making about 2 percent salt water.

☆ Mississippi

Water Apparently Eliminated In Adams County Deep Test

Salt water apparently eliminated in Adams County test; new Wilcox oiler for Jefferson County field.

Adams County: Phillips Petroleum Company's Mrs. Vic Artman 1, 36-8n-2w, prospect 6 miles northeast of Natchez, is preparing to complete after successfully eliminating salt water input. Production was established in Wilcox sand section through 16 perforations between 5618-22 feet, and the well flowed 171 barrels of oil per day with 9/64-inch top and ¼-inch bottom chokes. Gravity of the oil was 40.9 and tubing pressure 375 pounds per square inch. No salt water was noted in the new test.

In the Cranfield field Gulf Refining

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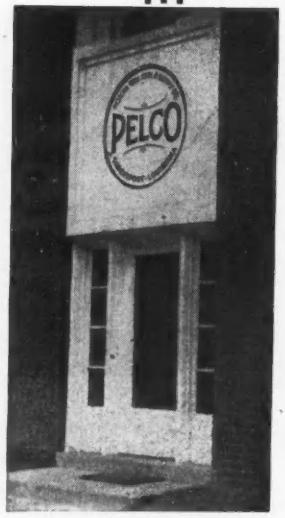

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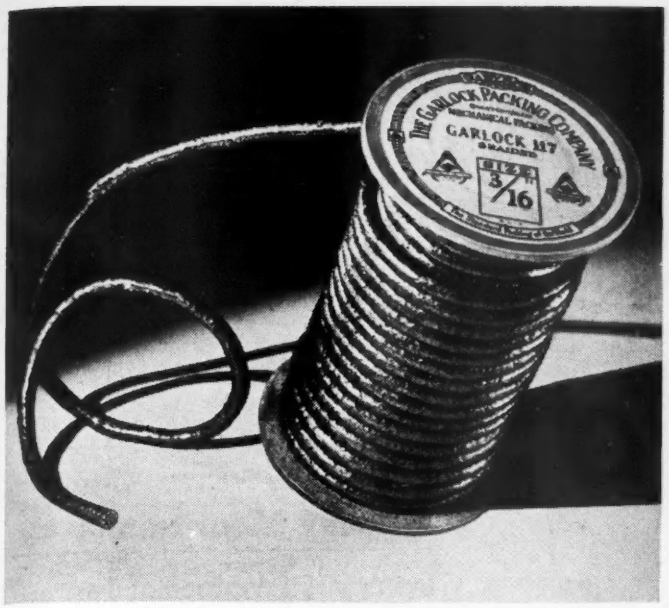

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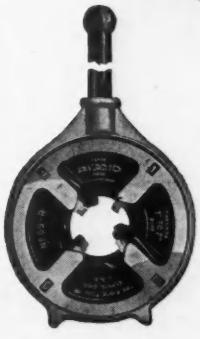

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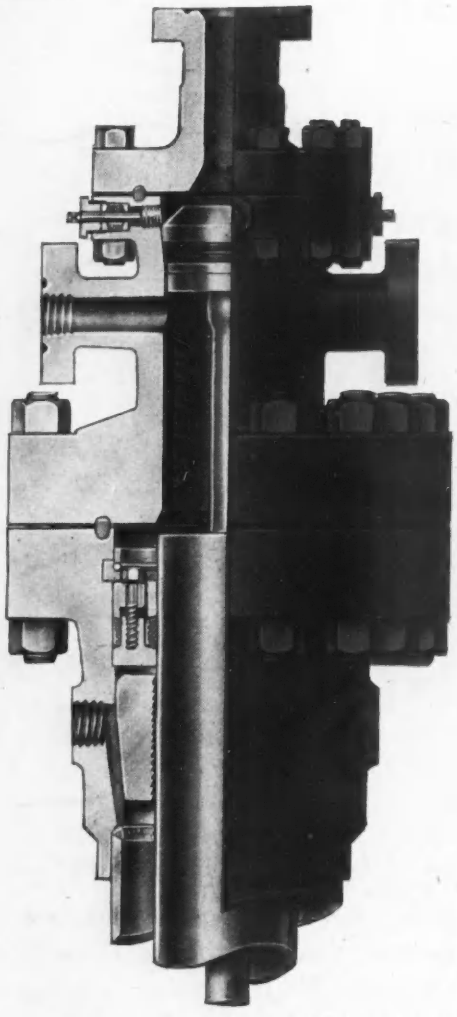
Company's Ella G. Lees 8, 49-7n-1w was successfully completed with an initial production of 437 barrels per day. Production was established at 10,310-334 feet opposite the Massive sand zone. A section of gas-bearing sand was reported discovered in the zone immediately above, but the find was not tested.

Jefferson County: Humble Oil & Refining Company's J. Fred Gordon 2, 31-9n-1w, may become Fayette field's first commercial oil producer from the Wilcox zone. A drill-stem test at 3636-43 feet well yielded 21 barrels of oil, 20 barrels of salt water and 1,097,000 cubic feet of gas per day through ¼-inch tubing choke. Later, casing was perforated at 3629-41 feet and the well flowed 10½ barrels of oil in a 16-hour test. Previously the hole had been drilled to 9800 feet and Massive sand section tested, but while good quantities of clean oil were noted, salt water production was very heavy. Humble's J. Fred Gordon "B" 1, 44-9n-1w, wildcat 5½ miles southwest of the Fayette field, is bottomed temporarily at 11,379 feet while fishing for tools. A drill-stem test of the Massive sand zone yielded only mud and salt water.

Lincoln County: Humble Oil & Refining Company's M. C. Randall 1, 17-6n-8e, Mallalieu field, has been successfully completed to establish the company's first production in the area. Casing was perforated at 10,467-486 feet opposite stringers above the Massive sand and on initial test the well flowed 208 barrels of oil per day through 1/8-inch tubing choke. Gravity of the oil was 38.2. No salt water was noted in initial test. In the Brookhaven field Crescent Drilling Company's J. F. Vernon 1, 31-8n-7e, northwest extension attempt, continued to swab after a drill-stem test at 10,463-486 feet opposite the lower Tuscaloosa yielded oil and salt water.

Washington County: Ormond Corporation's Douglass Wynn 1, c ne se 12-17n-8w, rank wildcat, is working below 700 feet. The test will explore the Eutaw and Tuscaloosa zone. Preparations are also being made for Warren Petroleum Corporation and Tide Water Associated Oil Company's State Park 1, c se ne 8-15n-7w, scheduled for the deeper horizons.



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☆ Rocky Mountain Area

Lysite Area, Wyoming, Test Has Gas Sand in Mesa Verde

Lysite area, Wyoming, wildcat tests another gas sand in Mesa Verde; Stanolind acidizes Park County discovery; tests of deeper formations to be made in Badger Basin; Glacier County, Montana, well completed as gasser.

Wyoming

Sinclair Wyoming Oil Company's test in the Lysite area, Fremont County, west of Casper, has tested another gas sand in the Mesa Verde (?) after making water in a sand in the same formation a week ago. Unit 1, NE NE NW 35-39n-91w, made a drill-stem test between 10,752-779 feet with recovery at the rate of 5,690,000 cubic feet of gas per day and 10 barrels of water per hour. The well is drilling below 10,789 feet and a total of 15 million cubic feet of dry gas has been tested in upper sands. This wildcat is among the state's deep basin seismic tests and its outcome will have a great bearing upon further development in the Wind River Basin. An estimated 75,000 acres in the general area are leased by major companies.

Park County: Stanolind Oil & Gas Company, as unit operator for the Elk Basin field on the Wyoming-Montana line, has acidized the lower section of the Madison formation in its discovery well at 38-M, NE SE NE 24-58n-100w. The well was treated with 2000 gallons of acid and swabbed and flowed 55 barrels of fluid in 24 hours, then 77 barrels of fluid in 5 hours through choke. A large percentage of the fluid was water. This test is of the lower section of the Madison with hole bottomed at 5013 feet, and top of Madison logged at 4350 feet. The well was cased with liner down to 4680 feet, through the more porous zone, and consequently the testing is not indicative of Madison formation possibilities. The lower section was hard and tight when drilled and on test before acidizing made very little oil. The Elk Basin field was one of the largest discoveries in the country in 1944 when the Tensleep formation was found productive and there are now 130 wells producing approximately 15,000 barrels per day from that zone.

At Badger Basin, which has been one of Wyoming's deepest producing fields for 15 years, General Petroleum Corporation is starting a test of deeper formations. The field has produced around

300 barrels daily from 6 wells in the Frontier formation at around 9000 feet, and Resolute Oil Corporation of Great Falls, who controlled the field, have processed the crude locally. The General Petroleum well is Badura 2, C NE NW 7-57n-101w, on the northwest side of the field, and is scheduled to test Tensleep formation below 10,000 feet.

Montana

Most interesting completion in Northern Montana in several weeks is Union Oil Company of California's McGuinness 7, SW NE NW 6-35n-5w, Glacier County, which found oil in the Madison formation 2 miles south of the Madison pay zone on the north end of the Cut Bank field. Gas was found in the Cut Bank sand, 2827-68 feet, but Union continued drilling to the Madison and found saturation at 3087-89 feet, total depth. The well swabbed 65 barrels of 40-gravity oil in 24 hours, but operator plugged back and completed for 9 million cubic feet of gas from the Cut Bank sand. Union has skidded the rig 50 feet and will drill another well to the Madison pay zone.

☆ Ohio

Wheeling Pool West Branch, Coshocton County, Extended

West branch of Wheeling pool extended; gas discovery made south of Elyria; East Avon Center extended; flowing well at Sego; Deerfield test shows oil.

Coshocton County: The Ohio Fuel Gas moved ½ mile north of the Powelson to extend the west branch of the Wheeling pool with a completion on J. H. Miller, Lot 3, Linton Township. Oriskany sand at 3288 feet gauged 2 million cubic feet of gas natural.

Lorain County: G. B. Harmon's test on Shuster, NE SE 2, Carlisle Township, came in at 310,000 cubic feet natural and was shut in on the casing with 1070 pounds pressure. Clinton sand was logged at 2300-07 feet. William Dempsey's O. D. Bliss 1, SE NW 27, Avon Township, extends the East Avon Center pool ¾ mile southwest. The Clinton at 2381-95 feet gauged 400,000 cubic feet natural with a rock pressure of 750 pounds.

Perry County: Preston Oil Company in a 1000-foot move west with C. W. Shaw 2, NE NW 33, Madison Township, found the Clinton at 3229-68 feet with a good showing of oil. After a 100-quart shot the well swabbed and flowed 90 barrels.

Morgan County: Industrial Gas' H. H. Bankes 1-C, NW NE 20, Deerfield Township wildcat, drilled through the Clinton at 3997-4027 feet with 1000 feet of oil in the hole. After a 90 quart shot the well made 25 barrels.

☆ Michigan

Carter Has Oceana County Strike in Traverse Lime

Carter opens pool in Oceana County; Monterey pool, Allegan County, extended; Ohio's Ogemaw County test may go to 15,000 feet.

Oceana County: The Carter Oil Company's Miller 1, NE SW SW 11-13n-

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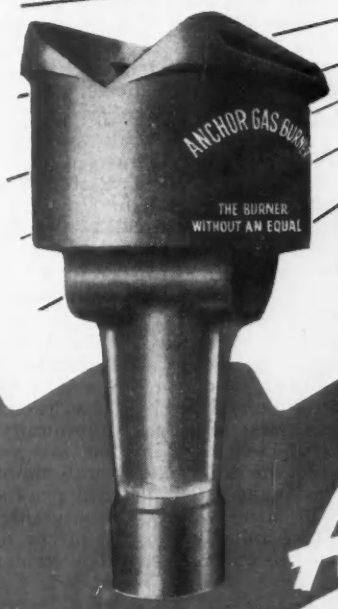

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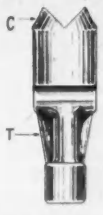

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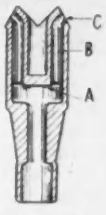

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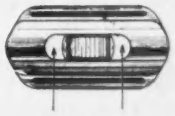

Top view showing the twin vents in the air cooled head. Scale, rust, dirt, etc., from the boiler fall through harmlessly, while secondary air, a definite aid to efficient combustion, rises easily and positively through the openings.

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18w, is expected to intensify exploratory work in Northwestern Michigan. The wildcat averaged 8 barrels per hour natural through 5-inch casing from 1629-31 foot Traverse lime pay before it was pinched to an average rate of 100 barrels per day.

Carter has a solid lease block in the area and around 400,000 acres under lease in the Oceana district.

The structure was identified by a 2-year survey supported by an intense core drilling program.

Allegan County: Fisher-McCall, Inc.'s Bally 1, SW SW SW 17-3n-13w, outpost a mile southwest of old Monterey pool, logged Traverse lime objective at 1649 feet and at 1684 feet showed a hole full of oil.

Ogemaw County: The Ohio Oil Company is clearing location for a projected 12,000 to 15,000-foot test on the West Branch structure (now producing from Dundee at 2600-2800 feet).

The company plans to penetrate to basement granite rocks, which is certain to exceed 11,000 and may require a 15,000-foot test.

Present depth record in Michigan is held by Gulf Refining Company's Bateson 1, Kawkawlin field, Bay County, drilled to 10,447 feet in 1941.

☆ California

Record Wildcat May Sidetrack If Drill Pipe Is Not Freed

Pacific Western working to free drill pipe in world's record well; Superior completes gas injection well in Rio Bravo field; 2 wells near completion in new Alondra field; tests in East Los Angeles well are unimpressive; another wildcat to be drilled in Leffingwell area; gas well completed in Dominguez field.

Kern County: Pacific Western Oil Corporation continues optimistic about the eventual freeing of drill pipe in its world's record deep well, National Royalties 1, east of the Lost Hills oil field. The pipe stuck at 16,668 feet, just 13 feet below the previous world's record, and a week later had not been freed, although circulation was being maintained. Operator theorizes that a chunk of sandstone may be lodged between the side of the hole and the bit. If the pipe cannot be freed a cut may be made just above the bit and an attempt made to sidetrack past the obstruction. Latest record dug up for the well is that the 8¾-inch hole is the largest hole ever drilled below 13,000 feet.

Prospectors continue to be interested in the possibilities of developing further schist production in the Arvin area. Tests to be drilled soon include Tide Water Associated Oil Company's Tupman 23-9 in 9-31s-29e and East San Emidio Oil Land Company's Barlow 1 in 30-31s-30e. Western Gulf Oil Company's recent schist discovery, DiGiorgio 1 in 10-31s-29e, is currently flowing 36 barrels of 31.9-gravity clean oil through 18/64-inch choke.

The Superior Oil Company's Burner 1 producer in the Rio Bravo field has been deepened from 11,415 feet to 11,511 feet and brought back on production flowing 336 barrels of 38.3 gravity oil through a 14/64-inch choke. Well will be converted to gas injection.

Shell Oil Company attempted to make 2 formation tests in its Ten Section field deep test, KCL-A 53-30, but both were failures and drilling is proceeding below 10,990 feet.

Los Angeles County: Two wells on stepout locations in the new Alondra field are coring in oil conglomerate and the probability that both will be completed as producers is good. One is the Texas Company, Operator, Gardena Community 9-1 in 26-3s-14w, ½ mile southeast of the discovery well, which is coring at below 9500 feet; and the other is the British American Oil Producing Company's Alondra Park 1 in Sect. 22, coring below 9255 feet. These will be the first wells completed in the field since the discovery, Bodger 1 in Sect. 22, was brought in last summer by British American and Texas from 9154 feet.

Oily, gassy mud and salt water were recovered on formation tests of the interval 7712-7747 feet in Richfield Oil Corporation's Union Pacific Unit 3, East Los Angeles field, 16-2s-12w. Only 2 producers have been completed in this field since its discovery about a year ago.

Standard Oil Company of California will make another attempt to obtain commercial production in the Leffingwell area southeast of the Santa Fe Springs field. Operator has staked German Community 1 in 11-3s-11w, about ¼ mile southwest of Lewis Community 1, which it drilled to 12,184 feet last year. Standard worked for several months trying to make a commercial producer out of the latter well but was unable to do so. Two miles southwest of the new Standard location, General Petroleum Corporation is drilling La Mirada Community 46-1 below 12,225 feet. The general area is being intensively explored because of past showings obtained by both companies. Principal obstacle to production is the depth and tightness of the sand.

Shell Oil Company has completed Reyes 145 in the Dominguez field as a gas well flowing 1,900,000 cubic feet through ¼-inch choke from 3720 feet. This gas sand is just above the First Callender oil zone. Shell will use the gas in its nearby Wilmington refinery.

Solano County: Amerada Petroleum Corporation has completed E. Wineman 2 in the Maine Prairie gas field flowing 4,894,000 cubic feet through 3/8-inch choke. Total depth is 4791 feet.

Washington

Standard Oil Company of California has begun work on its western Washington exploratory well located in the vicinity of Martha Lake, 8 miles northeast of Edmonds. Site is being cleared preparatory to moving in drilling equipment.

The well, Alderwood 1, is in 35-28n-4e. Selection of the site was based on a series of seismograph tests conducted by the company during the past year.

The plan for drilling in this area was first announced by H. D. Collier, chairman of the board, during a recent visit to Seattle.

This will be the third attempt by Standard to discover oil or gas in Washington. In 1920 the company drilled a dry hole in the Moclips area near Aberdeen. Its second venture in Whatcom County was abandoned early this year.

Oregon

Texas' new oil test well will be drilled near Mist, Ore., about 12 miles south of Clatskanie on the Nehalem River. Bulldozing has been completed and a cement base installed. Drilling will start soon.

☆ Canada

Another Alberta-Saskatchewan Border Area Strike Indicated

Lloydbrook Syndicate 1, SE lsd 1 2-51-1w4, cased after coring 6 feet into a mushy, oil-saturated sand, looks, like another discovery for the general Lloydminster area, along the Alberta-Saskatchewan border.

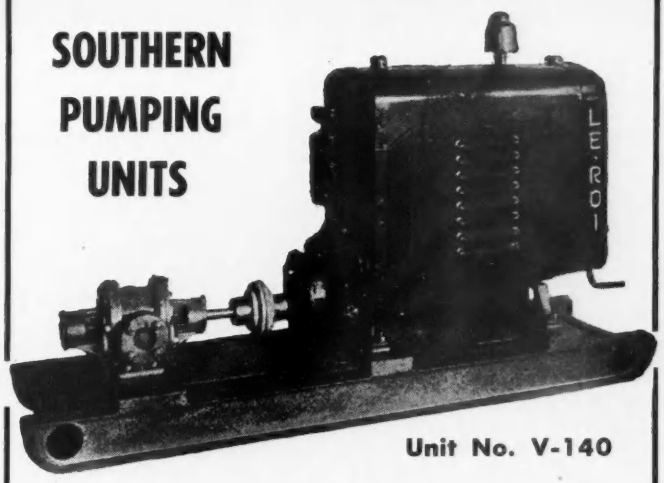
Located 7 miles from previous production, the Lloydbrook wildcat links up with discoveries made earlier this year to form a triangle with its north point at the new strike, a mile inside the Alberta border; its south point at the recent discovery, Withers-Lone Rock 1, 26 miles southeast and 10 miles inside the Saskatchewan border; and its northwest point at Lloydminster Oil Producers 3, 8 miles southwest of the Lloydbrook strike and 8 miles inside the Alberta border. With the exception of a few hundred acres in the heart of the field, drilled out on 10-acre spacing, this great triangle has been tapped the past few months by less than a dozen wildcats, spaced from 1 to 8 miles apart.

The Lloydbrook test was drilled by T. L. Brook & associates, backers of the Withers-Lone Rock success which extended the south extremity of the oil area. With rotary table elevation 2097 feet, well was spudded December 1, cored the Lower Cretaceous contact at 1640 feet, the Colony sand, indicating gas in cores at 1650-57 feet, some oil saturation at 1670-78 feet, and water-bearing sand immediately below. No drill-stem tests were run of this section, so potentialities are unknown. On December 6 the Sparky sand—chief Lloydminster area oil source—was cored at 1839 feet, 258 feet above sea level and slightly higher than average Sparky elevation in the Lloydminster field to the south. Coring was halted 6 feet in at 1845 feet, the sand logging mushy and oil-saturated. Casing has been set to the sand contact, and well will drill plug and start test shortly.

The rig from the Lloydbrook has been shifted to a new wildcat, Zero Syndicate 1, NW lsd 13 11-52-2w4, about 10 miles north and west. This well is expected to complete by December 20. The Brook group is its backers.

Lloydminster oil ranges in gravity from 14 to 17.9. Initial potentials range to a high of 160 barrels daily, although average in the developed section of the field is about one third of that figure. The great area opened up in recent months indicates that current total potential of 60 to 70 thousand barrels monthly could be expanded in a few months to many times that rate, provided adequate casing is available, and the market for the heavy crude can be expanded in line with the development. Only current outlet is a 1000-barrel capacity Petreco cleaning plant which is turning out fuel oil for the Canadian National Railway. Husky Refining Company of Wyoming is now erecting a Petreco unit and a refinery to turn out asphalt, diesel and tractor fuels and a small percentage of gasoline at Lloydminster. Husky will commence taking oil deliveries in January, and should have its plant in operation in the early spring. Its initial capacity will be about 2500 barrels daily. Plans call for expanded capacity as field potential and markets warrant.

SOUTHERN PUMPING UNITS



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The excerpts below are taken from a letter recently received from Mr. G. Frederick Shepherd, Consulting Geologist, of New Orleans, La.

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"Experiences during the past two years have convinced me that a drilling time recorder has become a 'must' for drillers, tool pushers, and operators as well.

"During these years the use of drilling time logs has saved in direct economies several times the cost of the rental of the machine on each job, and in some cases information thus gained in advance of electrical logging has been of immeasurable value."

(Signed) G. Frederick Shepherd

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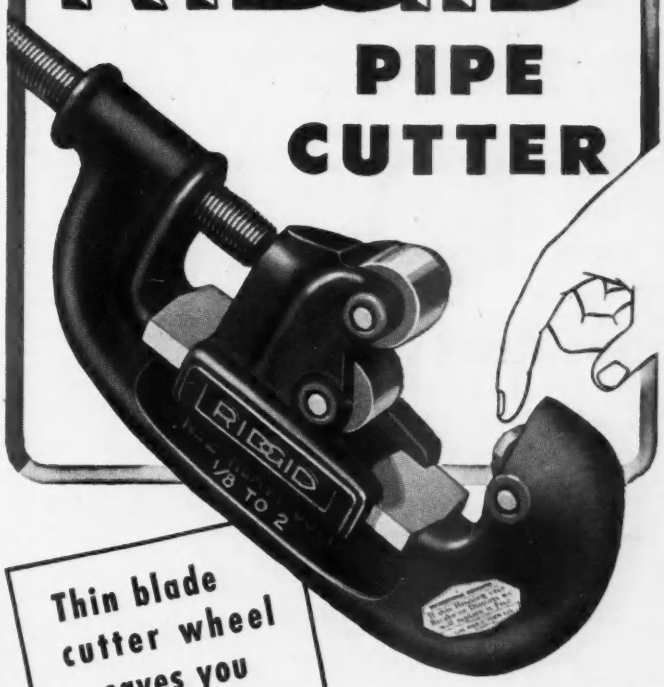

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EXPLORATORY COMPLETIONS

ARKANSAS OUTPOST

Columbia County—Village Extension: McAlester Fuel Co.'s J. G. Alexander A-1, ne ne 17-17s-19w, Cotton Valley 5200, perf Travis Peak 4833-38, pump 35 bbls 33-gr oil, 35 bbls sw, comp 11-30-46 at 7390.

CALIFORNIA WILDCATS

Kern County—Failure: Bandini Pet. Co.'s Jasmine 1, 35-25s-27e, Jasmine area, abnd 12-3-46 at 2899.

Tehama County—Failure: Tehama Exploration Co.'s Teco 1, 30-27n-5w, Red Bluff area, abnd 11-23-46 at 2736.

Santa Barbara County—Failure: Union Oil Co.'s Sisquoc 6, 2-8n-31w, Sisquoc area, abnd 11-30-46 at 6372.

COLORADO WILDCAT

Moffat County—Oil Discovery: Continental's Smith 1, nw se sw 30-5n-98w, Elk Springs, Dakota 3675, Weber 6087-6231, shot 77 qts 6126-6097, pump 175 bbls, comp 11-27-46 at 6231, pb 6140.

ILLINOIS WILDCATS

Effingham County—Failure: A. F. Stienlage's Seeley 1, se sw ne 35-9n-5e, abnd 2406.

Jefferson County—Failure: National Associated Petroleum Co.'s Talbot 1, nw nw nw 1-2s-1e, abnd 2406.

Marion County—Failure: Powell & Rea's Marlow 1, ne nw sw 30-4n-4e, abnd 2438.

Richland County—Failure: Perry Fulk et al's Hawkins 1, sw sw nw 5-2n-9e, abnd 3145.

Wabash County—Failure: Inland Producers' Bowlds 1, sw sw ne 21-1s-13w, abnd 2817.

INDIANA WILDCATS

Clay County—Failure: G. H. Froderman's Everwine 1, nw nw nw 19-10n-6w, abnd 1675.

Posey County—Failure: Nat. Assoc. Pet. Co.'s Walls 1, sw nw se 34-5s-14w, abnd 3115.

KANSAS WILDCATS

Mitchell County—Failure: Olson Drlg. Co. et al's Palen 1, nw sw se 26-8s-10w, abnd 4205.

Sheridan County — Failure: Stanolind's Thompson 1, nw nw se 10-8s-29w, abnd 4745.

KENTUCKY WILDCAT

Butler County—Failure: W. B. Phillips' Grise 1, 3-G-32, abnd 330.

NORTH LOUISIANA WILDCATS

Caddo Parish—Failure: Atlas O&R Corp.'s Abe Meyer Corp. 1, 1980 fr el 660 fr sl 17-17n-14w, abnd 12-1-46 at 3510.

Sabine Parish—Failure: O. H. Snyder's J. J. Blake 1, 87 s 476.2 w of c 22-7n-11w, abnd 11-21-46 at 3010.

SOUTH LOUISIANA WILDCATS

Calcasieu Parish—Failure: Union Sulphur Co.'s Brannon 1, 1650 s&e of nwc 21-11s-10w, 3/4 mi se Ellender 1 disc well, Bayou Choupique area, abnd 11-29-46 at 10,365.

Iberia Parish—Failure: Union Oil of Calif.'s Delcambre 2, 660 s&w of nec 4-14s-5e, 5 mi sw Avery Island, abnd 11-26-46 at 12,024.

SOUTH LOUISIANA NEW PAY TESTS

Iberville Parish—Bayou des Glaise Gas-Distillate Discovery: Humble's E. B. Schwing et al 2-B, fr nec sect 86 go sly alg el 1400 th wly parallel to nl 2400 to lcn in 86-8s-8e, perf 96 shots 1,716-726 at top of pay, flow 48 bbls 55.3-gr dist, 2,041,000 gas, 10/64-in, gor 43,-100/1, tp 4250 lbs, comp 12-4-46 at 11,890.

Terrebonne Parish — Lirette Gas-Distillate Discovery: Humble's LaTerre Co. 5, fr nec sect 32 go sly alg el 990 th wly parallel to nl 330 to lcn in 32-19s-19e, pay 9606, perf 180 shots 9606-24, flow 84 bbls 51.6-gr, 6,312,000 gas, ¼-in, gor 75,850/1, tp 3200 lbs, comp 11-27-46 at 10,580.

MICHIGAN WILDCATS

Bay County—Failure: Chapman Oil Company's Crapo 1, ne ne se 21-16n-3e, Dundee lime 3240, so 3350, abnd 12-6-46 at 3404.

Oceana County—Stony Brook Oil Discovery: Carter Oil Company's Miller 1, ne sw sw 11-13n-18w, Traverse lime 1607, pay 1629-31, flow 144 bbls 8 hrs, comp 12-3-46 at 1631.

Osceola County—Failure: Rowmor Corp.'s Thomas 1, se se nw 27-20n-10w, Dundee 3763, abnd 12-7-46 at 3970.

MISSISSIPPI WILDCATS

Forrest County—Failures: Sippiala Corp.'s L. Stapleton 1, se nw 25-5n-13w, Cap Rock 1325, abnd 11-6-46 at 1358.

Sippiala Corp.'s Richard Burrow 1, 26-5n-13w, Cap Rock 1197, abnd 11-15-46 at 1370.

Greene County—Failure: Wm. Helis-Union Oil of Calif's A. S. Miller 1, ne nw 19-1n-7w, Wilcox 2405, Chalk 5548, Tuscaloosa 7035, Massive sd 8503, abnd 11-30-46 at 8804.

Jefferson County—Failure: California Co.'s W. G. Greer 1, 10-9n-4e, Wilcox 3225 abnd 11-28-46 at 5616.

Lamar County — Failure: Humble's J. F. Fowler 1, c nw ne 27-2n-14w, abnd 11-25-46 at 10,500.

Rankin County—Failure: Phillips' Denkman Lbr. Co. 2, 23-7n-4e, abnd 12-5-46 at 6500.

Washington County—Failure: C. H. Murphy-Sun s J. C. Brown 1, 19-16n-7w, abnd 12-2-46 at 5150.

MONTANA WILDCAT

Musselshell County—Failure: Clark Drlg. Co.'s N.P.R.R. 1, nw ne se 9-11n-24e, Devils Basin, Madison 2620, Devonian 3250, comp 11-18-46 at 4078.

MONTANA OUTPOST

Glacier County—Cut Bank Gas Extension: Union of Calif.'s McGuinness 7, sw ne nw 6-35n-5w, 2 mi s Madison oil prod, Colorado 525, Moulton 2690, Sunburst 2802, Cut Bank 2827, Ellis 2868, Ellis-Madison 3035, swab 65 bbls 40-gr oil daily fr Madison 3084-89, comp 12-3-46 for 9 mln gas in Cut Bank sd, td 3089, pb 2895.

OHIO WILDCATS

Loraine County—Gas Discovery: G. B. Harmon's A. Shuster 1, ne se 2, Carlisle Township, Clinton 2300-07, flow 300,000 gas, comp 12-5-46 at 2330.

Lorain County—Failure: Ohio Fuel Gas Co.'s Tressa Pierce 1, Lot 5, Penfield Township, Clinton, abnd 12-2-46, at 2573.

OKLAHOMA WILDCATS

Cotton County—Failures: Trigg & Carlock's Cheton 1, sw sw se 33-1s-9w, abnd 3000.

L. W. Winkler's Lines 1, sw sw se 3-2s-11w, abnd 2665.

S. D. Johnson's Thomas 1, nw ne nw 17-2s-11w, abnd 2349.

J. W. Baldwin's Jenson 1, se se sw 29-2s-11w, abnd 2005.

Featherstone Oil's Dyer 1, sw ne se 33-2s-11w, abnd 1888.

Harper & Turner et al's McGee 1-A, se se ne 3-2s-13w, abnd 1895.

D. E. Whatley et al's Gore 1, sw sw ne 23-2s-14w, abnd 2005.

C. M. Day's Kenney 1, se se nw 2-3s-10w, abnd 1500.

L. H. Choate's Knight 1, sw nw sw 26-3s-10w, abnd 1606.

Lee R. Gower's Graham 1, sw se se 32-3s-10w, abnd 1502.

Norman Drlg. Co.'s Corbett 1, ne ne sw 30-3s-11w, abnd 2024.

Lundy-Shear's Lee 1, nw nw ne 30-4s-11w, abnd 2005.

Ben Schultz's Wolfe 1, se se nw 11-4s-12w, abnd 2545.

J. F. Richerson's Park 1, nw nw se 26-2s-10w, abnd 2208.

Burke Divide's Rogers-Watkins 1, sw sw sw 29-2s-10w, abnd 2510.

Griffin & Barbre's Ruyle 1, se se sw 20-2s-11w, abnd 2211.

L. H. Choate's Cain 1, ne ne ne 25-3s-10w, abnd 2208.

Hastings & Knight's Taylor 1, ne ne sw 34-3s-11w, abnd 1515.

Group 2 Oil Co.'s Ka-him-a-watch-it 1, se se ne 12-3s-12w, abnd 2002.

Standard of Kansas' Adams 1, se ne se 28-3s-12w, abnd 2257.

Griffin & Barbre's Scruggs 1, nw ne se

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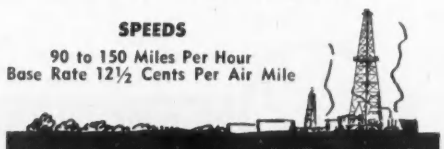

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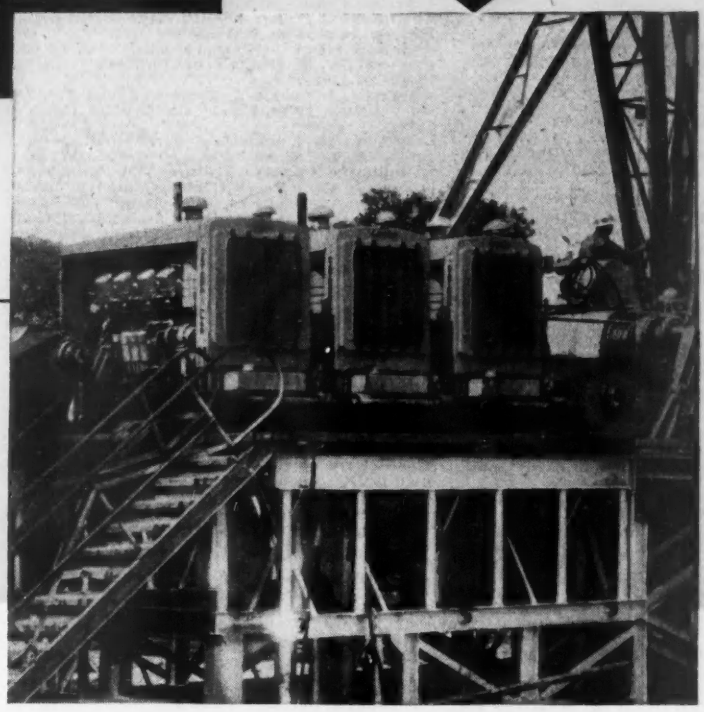

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30-3s-12w, abnd 2005.

Cochran & Cain's Thrasher 1, ne se ne 26-4s-10w, abnd 1650.

S. D. Johnson's Helton 1, sw sw ne 5-4s-12w, abnd 2670.

J. G. Beard's Soddie 1, nw sw ne 24-4s-12w, abnd 2503.

Akin & Dimock's Brown 2, sw sw sw 6-5s-12w, abnd 2210.

D. H. Bolin's Clampelt 1, nw nw nw 24-5s-12w, abnd 2305.

Jefferson County—Failure: W. J. Kimbrell's Bartling 1, ne ne se 28-4s-8w, abnd 3630.

Noble County — Failure: Fred Morgan's Wentz 1, ne ne sw 12-22n-1e, abnd 4825.

Payne County—Failure: Summitt Drlg. Co. et al's Buetow 1, se se sw 2-19n-1w, abnd 5098.

Pottawatomie County—Failure: Stanolind's Logan 1, nw nw se 20-11n-3e, abnd 5936.

Seminole County—Failure: Kingery & Patterson's Aldridge 1, se se nw 14-10n-7e, abnd 3734.

Stephens County—Failures: Nu-Enamel Operations' Henderson 1, ne ne sw 11-1n-4w, abnd 5520.

F. L. Chapman's Bull 1, se ne ne 34-2s-9w, abnd 2515.

Tillman County—Failures: L. W. Winkler et al's Stone 1-A, ne ne ne 4-3s-17w, abnd 2961.

Sellers & Brown's Rathburn 1, ne sw ne 10-3s-9w, abnd 2500.

SOUTH DAKOTA WILDCAT

Fall River County—Failure: Woodward-Morton Gov't. 1, ne sw sw 4-10s-4e (BHM) Pine Hill Leo 3000, abnd 3004.

WEST TEXAS WILDCATS

Crockett County—Failure: J. P. Pringle et al's Shannon-Stanolind 1, c nw ne E.L.&RR 14, blk BB, elev 2526, anyhydrite 1475, lime 2226, abnd 12-2-46 at 2665.

Ector County—Failure: Plymouth Oil Co.-McDaniel & Beecherl Drlg. Co.'s Headlee 1, 440 out nec T&P Ry 34, blk 41, T-1-S, elev 2978, anhydrite 1955, Yates 3260, abnd 12-7-46 at 5010.

Garza County—Failure: J. D. Hunter et al's Head-Woodley 1, 2633 snl 1787 ewl TWNG Ry sect 1142, anhydrite 610, San Andres 2020, Glorietta 3150, abnd 12-2-46 at 3750.

Crockett County—Failure: Stanolind's University 1-GG, c sw sw sect 12, blk 39, elev 2586, Ellenburger 7975, lime 8240-8330, dolomite 8330, abnd 11-22-46 at 8384.

WEST TEXAS NEW PAY TEST

Andrews County — Union Deep Failure: Shell's Scarborough 1-E, 662 nsl 806 ewl PSL 11, blk A-31, offset 7200-ft Clear Fork prod, elev 3385, base Permian 8150, Fusselman 8200, Montoya 8475, Simpson 8625, Ellenburger lime 9380, dolomite 9490-9630, granite wash 9630, granite 9703, abnd 11-22-46 at 9714.

WEST CENTRAL TEXAS WILDCATS

Callahan County—Failures: Woodley Pet. Co.-Danciger O&R's George 1-A, 660 out nec sect 76, Bayland Orphan Home Lands, elev 1596, Palo Pinto 2128-2290, Bend 3404, Mississippian 4108, Ellenburger 4155, abnd 12-3-46 at 4202.

Anzac Oil Corp. et al's Brightwell 2, 330 snl 3680 ewl Victoria CSL sur 202, abnd 11-22-46, 798.

Martin Properties' Foster 1, 330 out of nwc labor 7, lge 337, Victoria CSL sur, elev 1835, abnd 11-26-46 at 2504.

Jones County—Failures: S. D. Johnson-Russell Maguire's Olson 1, sw sw sw BBB&C sect 182, elev 1523, abnd 11-24-46 at 3399.

W. H. Rogers, Tr's H. L. Herndon 1, sw nw ne MEP&P Ry 6, elev 1802, base Saddle Creek 2375, Flippen sand 2430, abnd 12-2-46 at 2948.

Shackelford County—Failure: Harry Hines-B. H. Hilburn's Walker 1, 330 snl 1010 ewl ne¼ T&P Ry 59, blk 13, elev 1924, abnd 11-26-46 at 1763.

Taylor County—Failures: Sojourner Drlg. Co.'s Sealy-Smith 1, 330 nsl 1113 wel labor 3, Lge 147, Grimes CSL, elev 1863, abnd 12-1-46 at 3205.

Ungren-Frazier et al's Loving 1, 990 wel 330 nsl nw¼ T&P Ry 15, blk 16, elev 1706, abnd 11-16-46 at 2530.

NORTH TEXAS WILDCATS

Archer County—Failures: Harvey Drlg. Co.'s Abercrombie 1-H, 2000 nsl 1100 wel blk 30, Harris sbdv, abnd 11-15-46 at 1535.

Harvey Drlg. Co.'s Abercrombie 1-O, 750 nsl 2000 wel of M. Hutchinson sur 105, abnd 11-19-46 at 1469.

Harvey Drlg. Co.'s Abercrombie 1-P, 1250 nsl 70 ewl of Wm. Cound sur 2, abnd 11-22-46 at 1467.

Ted Harris et al's Gray 1, 150 out sec sect 2451, TE&L Co. sur, abnd 11-12-46 at 1520.

Montague County—Failure: Nu-Enamel Oil Operating Co.'s Perry 1, 1000 fr nel 640 fr nwl L. S. Farrer sur, elev 1270, Bend 6431, abnd 11-26-46 at 7104.

Archer County—Failure: John L. Crawford et al's Jones 1, 150 out of nwc blk 103, Jefferson csl sur, abnd 11-23-46 at 1202.

Haskell County—Humphrey-Chapman Discovery: Tom D. Humphrey's E. O. Chapman 1, 467 out nec blk 60, H. Tidwell sur, 3 mi ne Lawson fld, elev 1494, Canyon 2496, pump and flow 469 bbls, 8% wtr, 2000 gals acid, Strawn perf 4070-82, comp 12-4-46 at 5470 in Mississippi.

Haskell County—Failure: Tom D. Humphrey's Burnett 1, 467 out nec 488-ac tr and sbdn 2, J. Campbell sur 58, elev 1470, Canyon reef 2770, abnd 12-2-46 at 2808.

Montague County—Failure: Jack Grace-Nu-Enamel Oil Operating Co.'s Admire 2, 330 out nwc G. W. Fisher sur elev 1004, abnd 12-5-46 at 5437.

Wichita County—Failure: Frank Wood et al's Vanloh 1, 810 snl 150 wel of 100-ac tr and Mrs. T. E. Williams sur, abnd 11-28-46 at 2094.

Wilbarger County—Oil Discovery: Paradise Oil Co.'s Waggoner Est 1-I, 1045 nsl 520 wel H&TC Ry 11, blk 14, elev 1154, Canyon 3093, Ellenburger 4780, flow 480 bbls 38-gr, gor 600/1, natural via 3/8-in choke fr Canyon perf 3139-55 comp 12-7-46 at 4964.

EAST TEXAS WILDCATS

Franklin County—Failures: Ben T. Head et al's Litterell 1, 421 out nwc 145-ac lse, 421 ewl 700 snl J. N. Keith sur, elev 404 abnd 11-23-46 at 4530.

W. G. Post-Atlas O&R Co.'s Anderson 1, 660 out sec 65-ac tr J. M. Walters sur elev 499, Nacatoch 1315, Pecan 2180, Austin 3108-3172, Woodbine 3935, basal sand 4280-4485, Georgetown 4545, Paluxy 5445, Glen Rose 5985, massive anhydrite 6830-6970, Bacon porosity 6980-90, Rodessa porosity 7080-7115, Gloyd 7203, abnd 11-23-46 at 7266.

Houston County—Failure: John S. Ivy-W. T. Moran's Murray 3, 1980 nsl 1320 wel 706-ac lse, John Durst sur elev 188, Wilcox 1360, Midway 5433-6351, Pecan 6732-7087, Gober 7195-7247, Austin 7465-7789, Sub-Clarksville 7793-7812, Upper Woodbine 7883-8197, lower 8472-8504, Buda 8810, Georgetown 8890, Mainstreet 8960, Fredericksburg 9230, Goodland 9265, abnd 11-29-46 at 9551.

Leon County — Flynn Dome Discovery: Claude Bell et al's Browne-Carson 1, 660 fr nel 660 ewl of 94-ac lse, 4710 ne of swl 5278 se of nwl of Thos. H. Garner sur, elev 415, Midway 3050, Pecan 5377-5515, Gober 6035, Austin 6360-6706, Woodbine 7090, pump 8 bbls 34.8-gr fr broken Woodbine sand 7185-7303 comp 7-20-46 at 7303.

McLennan County—Failure: M. Koury-R. S. Hendrickson's McKie 1, 330 snl 1000 wel 100-ac tr and M. Snell sur, elev 596, abnd 11-30-46 at 756.

Van Zandt County—Failure: F. H. Jarrell-J. Garonzik's McLaughlin 1, 1120 snl 4950 ewl Smith Robinson sur, elev 449, Austin chalk 3200-3670, Woodbine 4140, abnd 12-1-46 at 4505.

EAST TEXAS NEW PAY TEST

Wood County—Norman-Paul Shallow Discovery: Sun's C. L. Clanton 1, 467 out of nec of 86-ac lse, or 467 wel 1100 nsl Allen Davey sur, 1694 sw of Woodbine disc elev 445, Midway 1044, Nacatoch 3020, Pecan chalk 2940-3210, base Austin chalk 4754, Sub-Clarksville sand (pay) 4796, Woodbine 5284, flow 180 bbls 33-gr, gor 167/1, natural ¼-in fr Sub-Clarksville perf 4854-58, 4833-50, comp 12-3-46 at 5562.

SOUTH CENTRAL TEXAS WILDCAT

Uvalde County—Failure: J. A. Green's Kennedy-Nunley 1, 3000 fr el 830 fr sl Jesus Flores sur 1063, 8042-ac lse, Austin chalk 666, Edwards Lime 1266, Glenrose 1830, abnd 11-8-46 at 3512.

SOUTHWEST TEXAS WILDCAT

McMullen County—Failure: Harry Ezzell, Agent's Harry Ezzell 2-A, 330 fr s&wl se¼ sect 39, Ezzell Rch sbdn on 160-ac tr, 650 fr wl 4800 fr nl S. B. Turner sur 9, 1 mi se prod, sw end of Ezzell fld, 3 mi nw San Caja fld, abnd 11-25-46 at 2045.

LOWER TEXAS COAST WILDCATS

Bee County — Failure: Stanolind's Nelson Lytle, Jr., 1, 660 fr swl 1980 fr nwl 494-ac lse, J. S. Maley, J. B. New, D. Cryer surs, 3½ mi sw Mineral, 2½ mi n Theis flds, abnd 11-17-46 at 9018.

Live Oak County—Failure: Rowan & Hope's J. F. Goodwin Est. 1, 330 fr ne&nwl 40-ac farmout of Stanolind lse, 3212 fr sel 2970 fr nel John Ely sur, abnd 11-26-46 at 4502.

Refugio County—Distillate Discovery: Wil-Tex. Oil Corp.-Herman E. Brown's Jamie Hynes 1, 2335 s of middle nl 3375 fr ely/el of 814-ac lse, 3250 fr nl M. Arocha sur, 1 mi nw old Refugio fld, pay 6480, perf 30 shots 6480½-82½, flow 25 bbl dist per million gas, 18 mln gas, open, shut in, comp 11-10-46 at 7453.

LOWER TEXAS COAST OUTPOST

Nueces County—Agua Dulce Extension: L. M. Lockhart's F. & G. Prochaska 1, 660 fr s&el 460-ac lse, V. L. de Herrera Gr, 4700 ne Lockhart's Herrman 2, 3600 n ne of Herrman 3, pay 5110, perf 24 shots 5114-24, flow 146.28 bbls 36-gr, 5/32-in, gor 410/1, comp 11-24-46 at 6858.

LOWER TEXAS COAST NEW PAY TEST

Goliad County—Cabeza Creek Oil Discovery: Continental's J. E. Pettus et al 11, 6630 se alg nel fr n cor Sebastiano Vela sur, th 660 sw at ra to lcn on 3696-ac lse, Wilcox 7602, Pettus pay 4528, perf 44 shots 4528-33, flow 191 bbls 46.1-gr oil, 0.1% wtr, 11/64-in, gor 787/1, tp 700 lbs, cp 1400 lbs, comp 11-22-46 at 7845.

UPPER TEXAS COAST WILDCATS

Ft. Bend County—Failure: O. J. Marten's J. R. Farmer 1, 660 fr s&wl 160-ac tr and R. H. Hunter sur, 1 3/4 mi e ne McCrary disc well, 2 mi s Clodine prod, abnd 11-22-46 at 7703.

Hardin County—Failure: Humble's Nora J. Liter 1, 377 fr n&sl 39.34-ac lse, Wm. W. Young sur, w flk of Sour Lake Dome, abnd 12-1-46 at 9090.

Wharton County—Failures: Sparta Oil Co.-Mikton Oil Co.'s A. A. Mullins 1, 330 fr sl 1178 fr el 90-ac lse, S. F. Austin 31/6 Lge Gr, s flk Boling Dome, temp abnd 11-25-46 at 5477.

D. M. Wallace's J. W. Kubela 1, 330 s&wl 190-ac tr, 1½ mi w Kubela prod, 1 mi e Lakeview prod, H&TC sur, abnd 11-23-46 at 6000.

BOWEN REMOVABLE SWIVEL ROPE SOCKETS

FOR SWABBING AND BAILING

These handy rope sockets prevent a fire hazard as they can be babbitted away from a well. They can be removed from the line without cutting the line or melting the babbitt.

The split liner type allows the babbitted line to pass through the Inner Assembly of Bowen Automatic Line Wipers and the solid liner in the other model will pass through the crown blocks.

Both models may be fitted for ½", 9/16" or ⅝" line and are 1⅝" O.D. Connection is 1-1/16" O.D., A.P.I. Sucker Rod Pin.

Split Liner Type, Price $27.50. Solid Liner Type, Price $21.50.
Complete instructions are furnished with each socket. Catalog with detailed information will be furnished promptly when requested.

Through Supply Stores anywhere in the U.S.A.

Split Liner Type

Solid Liner Type

BOWEN CO. of TEXAS, INC.

Office: 2429 Crockett St., P. O. Box 1025, HOUSTON 1, TEXAS, Phone C-9457
Odessa, Texas, Phone 15—Midland, Texas, Phone 1439

Fire Destroys Rig

A drilling rig and equipment owned by Wright & Dunkle, Tulsa contractors, was destroyed by fire near Cleveland, Okla., December 8.

The OIL WEEKLY'S TRADING POST

USED EQUIPMENT FORUM

CLASSIFIED ADS . . . EQUIPMENT . . . SERVICES . . . PERSONNEL

FOR SALE

■ **5 Complete Reda Pumping Units. Cables like new. 75 and 97 H.P. Motors. Max Steinbuchel, 1905 Park Place, Wichita 4, Kansas. Phone 5-6082.**

■ Well drilling machines, Fort Worth, Wichita, Keystone, Star spudders, standard outfits; Sullivan drills, steel derricks, tools, cable. All equipment overhauled or rebuilt and guaranteed. S. W. Pressey, Pueblo, Colorado.

4— 5½' x 10' (⅝" thickness) Welded Horizontal Steel Bulged Head Tanks.
4— 6" ID Crane Gate Valves, Fla. 200-Lbs.
4—12" ID Crane Gate Valves, Fla. 200-WOG.
8— 6" ID Crane Ells, 45°, Fla.
13— 6" ID Crane Ells, Fla.
17— 6" ID Crane Tees, Fla.
12— 6" ID Nordstrom Valves, Fla. MN 125 SP.
In Purification Plant used less than six months. The Oxford Pipe Line Company Ltd., Brownsville, Ontario, Canada.

■ **Lumber for sale: 5 cars 3 x 12—10' to 16' Hardwood $49.00. 5 cars 3 x 6 & wider Hardwood roadway lumber $43.00 to $49.00. Fir timbers 12 x 12 & larger 40' to 120' in length. 1 x 2 and 2 x 2 Surveyor stakes. Hardwood pallets for sale. E. J. Gaiennie Lumber. Box 1074, Shreveport 89, La.**

■ For Sale or Rent—Frost Gravimeter and all equipment necessary to completely outfit a Gravimeter crew. All in excellent condition. Wells Geophysical Co., 209 Hunter Building, Shreveport, Louisiana.

For Sale

Practically new Landis 10" pipe threader, Model No. 51C326-D10, about 1 year old. Complete with quick-opening die head 2½"-4", extra new Landis quick-opening die head 2½"-6", 9 sets 8P-API American Ro-Taper pipe dies and 2 chuck wrenches. Equipped with General Electric 10 H.P. motor 3/60/220/440 and magnetic starter. Actual use period less than 3 months. Condition equal to new.

In Stock for Immediate Shipment
Price F.O.B. Indianapolis Loaded Cars
$4750.00

WINSTON MACHINERY CO., Inc.
517 South Delaware Street
INDIANAPOLIS, INDIANA

USED WHITE TRUCKS

2—Model 922, 12½ Ton Tandem Axle, 150 H.P. Cummings Diesel motors, Dual winches, Each truck rigged for oil field work. 11:00 x 24 tires. $7500.00 each.
1—Model 922, short wheel base, single winch, otherwise same as above. $6500.00.
1—Model 722, 10 Ton single axle, 125 H.P. gas motor, single winch, 11:00 x 20 tires with 35 ft. Tandem Float, also 11:00 x 20 tires rigged for oil field work. $7500.00.
1—Model 708, 5 to 7 ton single axle, single winch, 11:00 x 20 tires rigged for oil field work. $2500.00.
2—Model 704, 2½ to 3 ton single axle, single winch, 9:00 x 20 tires rigged for oil field work. $2000.00.
1—Tandem Trailer, Pole, Fruehauff, 11:00 x 20 tires, Air brakes. $2000.00.
1—Tandem Trailer, Pole, Fruehauff, 11:00 x 24 tires, Air Brakes. $2000.00.
2—Single Axle Trailers, Pole, shop made, 9:00 x 20 tires, Air brakes. $500.00 each.
All Tires in Good Condition.
Call or Write J. R. Davis, Eunice, New Mexico. Box 440, Phone 23 or 66.

FOR SALE

■ NEW CORE DRILL: Franks Model FA—Heavy Duty hydraulic, kelly drive, rated 1500 feet. 4½" x 6" Gardner-Denver pump. 27 foot mast. Mounted on 138" wheel base, 1946 model 4-wheel drive 3 ton Oshkosh truck; 10 speed, with 9:00 x 20 ground grip tires, dual rear. Hercules 320 cu. in. engine. Factory mounted Tulsa 18 winch in front. 140 feet new 2⅜" drill pipe, kelly, bits, hose and tools included. Designed for core, shot-hole, or water well drilling in difficult areas. Drill completed in September, tested, but never used. Location, Colorado. Price $12,000. Identical drill working same area. Same unit present cost in excess $13,500. Box 101, The Oil Weekly, Houston, Texas.

■ DRILL PIPE—6500 feet 4½-inch grade D range 2 National Internal Upset with Hughes Acme Streamline joints. Excellent condition. Located Taft, Texas. Hancock Drilling Co., 7045 Chocolate Bayou Road, Houston, Texas.

"LUCITE" SHEETS & RODS
Cast Tubing & Plastic Materials for Instruments & Chemical Use
Insoluble Gaskets, Packing & Solid Valve-Ball Floats
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STEEL STORAGE TANKS
90-10,000 Gallon Capacity
Tank Car Tanks
Cleaned—Painted—Tested
Also, a large quantity of used 13" and 15" Channel Iron as removed from Tank Car Underframes
Located in Oklahoma
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Phone: BAYport 3456
702 Ritz Building, Tulsa 3, Oklahoma
Phone: Tulsa 2-9238
"ANYTHING containing IRON or STEEL"

SITUATION WANTED

■ Geologist available for part-time connection in Houston. Box 109, c/o The Oil Weekly, Houston, Texas.

ADVALOREM TAX MAN AVAILABLE after January 1 for progressive company that desires to organize a tax department. Six years experience as tax assessor-collector of medium size Texas county. Petroleum major Texas A. & M. 1938. Additional studies in personnel and labor problems. Graduate studies in municipal administration. Age 31. Married with two children. Best of references. Address: Box 107, c/o The Oil Weekly, Houston, Texas.

FOR RENT

FOR RENT
POWER PUMP
New 5 x FXO Gardner-Denver Powered with new Waku Motor.
6000 pound test Cameron Blowout Preventers

FOR SALE
Jack Knife Derrick
126 Foot Lee C. Moore.
2 10¾ 6000 pound test Shaffer Blowout Preventers.
Earle Adkison
Box 814 Houston Fairfax 9339

HELP WANTED

■ WAREHOUSEMAN desired by Independent Oil Company for work in South Louisiana. Knowledge of Rotary Tools essential. Starting Salary $250.00 per month. Reply Box 109, c/o Oil Weekly, Houston, Texas.

■ Land man for company operating throughout Midcontinent. Must be well rounded and should have wide acquaintance and knowledge of Gulf Coast areas although not absolutely necessary. Replies will be confidential. Box 106, The Oil Weekly, Houston, Texas.

■ Reflection Party Chief by Contract Company. Many years actual Party Chief experience not essential if thoroughly trained in interpretation work and able to handle Party problems competently. State age, education, experience, when available and telephone number in answer. Box 107, The Oil Weekly, Houston, Texas.

■ Unusually attractive opportunity for experienced seismograph party chief. Apply in care of the Oil Weekly, Box 104, Houston 1, Texas.

SERVICES

■ Oil Industry Employment Service, P. O. Box 2603, Tulsa, Oklahoma. For technical and trained personnel. Licensed. Bonded. Confidential. No charge to employees.

ADVERTISING RATES

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Regular classified advertisements for this special section, set in type this size without border, take flat-rate of 7 cents per word for the first insertion and 5 cents per word for each subsequent insertion of same copy. Display advertisements for this section, set in suitably larger type with ruled border, are $5.00 per inch for the first insertion and $4.00 per inch for subsequent insertions. Remittance must accompany copy which should be sent to:

Trading Post Section, The Oil Weekly
P. O. Box 2608 Houston 1, Texas

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Code: TUNICATE

Wipes tubing dry. No oil to drip on hoist, rig or tools. Rugged alloy steel housing holds free-floating, self-centering, standard Patterson-Ballagh Special Rubber Wiper.

Housing bolts to flange type heads on bolt centers 9 to 16". Tubing spider is set on top of housing which is constructed to take heaviest tubing loads. Three eye bolts, provided with hammer nuts, lock down lid to hold wiping rubber.

Special Rubber Wiper uses same tension principle as Patterson-Ballagh Drill Pipe Wipers. Steel reinforcing ring, molded inside rubber, makes center wiping web flexible, resilient yet firm, durable, and long lasting. Flash-fireproof.

Order complete assembly by code name: TUNICATE. Wiping rubber replacement, code: WINNOW. Send for Catalog No. 180 or see your Supply Store.

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TUBING WIPERS

1900 E. 65th Street, Los Angeles 1
6247 Navigation Boulevard, Houston 11
808 Graybar Building, New York 17
931 Russ Bldg., San Francisco 4

SQUEAKS from the BULL WHEEL

And Well Seasoned

She was in the department store buying a brassiere.

"What size do you want?" inquired the saleslady.

"I don't know," was the hesitant reply.

"Grapefruit?" inquired the saleslady.

"No."

"Orange?"

"No."

"Lemon?"

"No."

"Egg?"

"Yes, fried."

The (Honey) Moon Is Down

It was June and the elderly gentleman had married the beautiful young thing, and having business in Washington, he decided, against the advice of his best friend, to combine his Washington business with his honeymoon.

Upon his return his friend inquired: "How was the honeymoon?"

"Oh, so-so," was the reply.

"Well, you ought to have had more sense than to have spent a honeymoon in Washington during all this heat," retorted his friend.

Replied the elderly gentleman: "It wasn't the heat; it was the humility."

This Curious World

Upon investigation, the death of an absent-minded professor who had hurled himself from the tenth story of a hotel was found to be due to the fact that he had just finished smoking a cigar and had thrown the wrong butt out of the window.

When a man has a birthday, he takes a day off. When a woman has a birthday she takes a year off.

A lady is a woman who makes it easier for a man to be a gentleman.

No woman is truly beautiful unless she has a lovely
profile
all
the
way
down.

Hints for Householders

"You have to hand it to Joe when it comes to necking."

"Why, the lazy thing!"

Quick Thinker

A charming gentleman of 50 and a lovely but fading lady of 35 had been boon companions for many years.

One night she lifted her head from her pillow and voiced a happy thought. "Dear, let's get married."

"Oh, don't be silly," was the sleepy response. "Who would have US?"

Could Be

A small boy was asking advice of his pal. "I've walked to school with that dame three times and carried her books every time. I loaned her my raincoat one day when it rained and another day I bought her a chocolate soda. Now do you think I ought to kiss her?"

"Certainly not! You've done enough for that chick!"

Poet's Nook

There was a little lawyer man
Who gently smiled as he began
Her dead husband's will to scan.
And thinking of his coming fee
He said to her quite tenderly,
"You have a nice fat legacy."
Next morning as he lay in bed
With plasters on his broken head
He wondered what in hell he'd said.

One Thing at a Time

A reporter was out after a story about the oldest citizen of a neighboring town. He found another old-timer who knew the centenarian and planked a question, "How do you account for your friend having lived all these years?"

"Well," replied the other, "I'd say it's becuz he's never done anything else."

Which checks along pretty well with a letter received last week by THE OIL WEEKLY in answer to a query regarding a prospective correspondent: "his reporting is usually accurate although his industrious moments are spasmodic."

Life Is Like This

"I thought it was love at first sight. He fascinated me and I kissed him."

"Yeah, and then he began to unfascinate you and it was all over."

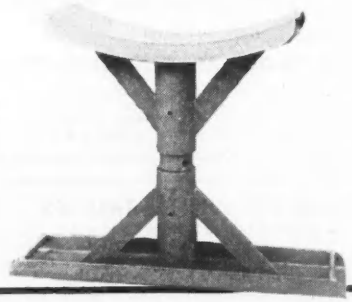
The Long Pull

"How about another kiss?"

"No, we mustn't. Father will be home in an hour."

OWEN

IT'S SIMPLE AND EASY TO LEVEL BOILERS WITH OWEN BOILER JACKS



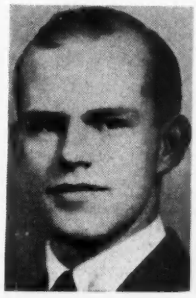
You save during setting-up time when Owen Boiler Jacks are used because only one man is required to level boilers. Owen Jacks are composed of only three pieces . . . base, cradle and screw . . . and a bar is the only tool required to raise or lower the jack. Hand grips simplify handling and coarse threads on the screw lift heavy loads with a minimum of effort.

Keep your boilers operating at highest efficiency and lowest maintenance cost . . . keep them level with Owen Boiler Jacks.

AVAILABLE FOR IMMEDIATE DELIVERY THROUGH SUPPLY STORES

OWEN TOOL COMPANY
ROUTE 9 BOX 800-B V-2-4341
HOUSTON, TEXAS

Brinton C. Wentz has been appointed proration engineer of Continental Oil Company and will be stationed at Ponca City, Okla. He succeeds **Charles R. Allen,** who was made California regional manager of Continental's production department. Wentz has been assistant proration engineer for ten months, and has been with the company since 1938, having been first connected with the sales engineering division. In 1939 he was transferred to the general offices of the production department.



Brinton C. Wentz

»

L. B. Herring, manager of the oil and gas division of the Second National Bank, Houston, has been made a vice president. He has been associated with the oil and gas industries since 1923. Following his graduation from the University of Kentucky, he served The Atlantic Refining Company, Marland Oil Company, and a firm of oil and gas consultants in Ft. Worth. He became an independent consultant in 1935, specializing in evaluations of oil and gas properties for banks and other concerns.

L. B. Herring

»

Dr. H. N. Fisk, associate professor of geology at Louisiana State University, will speak on "Geology of the Lower Mississippi Valley," before the Houston Geological Society December 18, at 8 p. m. in San Jacinto High School. Dr. Fisk is also a consultant with the Mississippi River Commission and has written several papers on the Mississippi Valley.

»

R. L. Collier will become district manager of the North and West Texas-New Mexico district of Continental Supply Company on January 1, succeeding **T. D. Collins,** resigned. Collier has been with the company since 1925, starting as stenographer - bookkeeper and being made manager of the Corsicana, Texas, store a year later. He also managed the Mexia and Refugio, Texas, stores until 1934, when he was made assistant district manager of the South Texas district with headquarters at Corpus Christi.

R. L. Collier

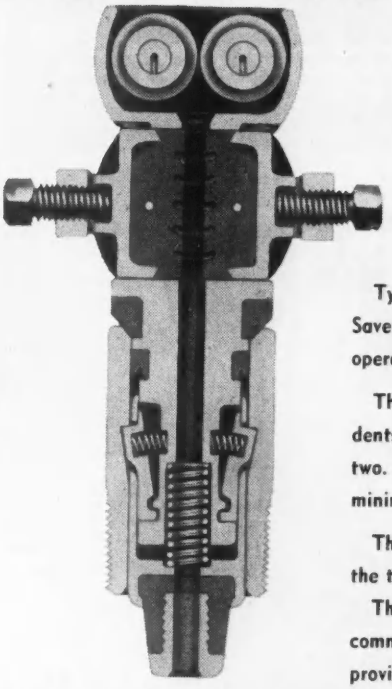
M. S. Patton, Jr. has joined the engineering staff of Sunray Oil Corporation and has been assigned as Big Spring district engineer in West Texas. He worked for Shell Oil Company as junior engineer before joining the U. S. Air Corps, from which he was discharged with the rank of captain in 1945. **P. L. Minshall,** former production clerk with W. C. Morris Company, has joined Sunray as a materials clerk. He had six years' experience as purchasing agent for E. H. Moore and for two years was assistant manager of outside production for Engineering Laboratories.

R. H. Tucker and **W. Harlan Taylor** are president and secretary, respectively, of Tucker Exploration Company, Delaware corporation with a capital stock of $74,000 that has obtained permit to operate in Texas. Headquarters are in the Sterling building, Houston.

»

George J. Economedes of Rio Grande City is secretary and in charge of Texas operations of Starr County of Texas Oil & Gas Development Corporation, Delaware corporation capitalized at $300,000 which has obtained permit to operate in Texas.

FOR WIRE LINE CORING



Be Sure IT'S A KING *Be Safe*

TYPE 3AR AUTOMATIC RELEASE WIRE LINE STRIPPER

Type 3AR King Wire Line Stripper, (often called "Oil Saver"), is the ideal tool to use in connection with swabbing operations.

The positive latch and sure release, insure against accidents and eliminate the possibility of jerking a wire line in two. The non-sparking materials used in its construction, minimizes the fire hazard.

The packing is inserted from the sides of the tool and the tool can be repacked while the line is in the hole.

The roller line guides, center the line and outlast the more commonly used bushing many times. Grease nipples are provided to lubricate the guide rollers. Convenient hand holds contribute to easy handling of the tool. *This tool is constantly coming into greater use.* A trial is convincing.

For WIRE LINE CORING
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is widely used

The Type 4AR Stripper is similar to the Type 3AR, except it is a little larger. It is commonly used in connection with the the Type 4C King Circulating Head. It can be, and sometimes is used with other makes of circulating heads.

All prices F.O.B. Houston, Texas and subject to change without notice.

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HOUSTON 10, TEXAS

C. U. Daniels, former vice president of Oklahoma Natural Gas Company, Tulsa, who resigned to become general manager of Pantepec Oil Company at Caracas, Venezuela, will succeed Warren W. Smith as president of that company upon Smith's retirement April 1. Daniels will make his home in Caracas. He joined the Oklahoma Natural Gas Company as vice president in 1938, after having been in the oil and gas business in Texas and Oklahoma since 1913.

Wade H. Smith, assistant chief scout for Magnolia Petroleum Company, Dallas, has been transferred to Mount Vernon, Ill., as scout for Illinois, Indiana and Kentucky. He succeeds **Garver O. Frazier,** who resigned.

Don G. Benson, district geologist for Sinclair Prairie Oil Company in Houston since 1939, is being transferred to Cia. Consolidada de Petroleo, Santa Barbara, Venezuela. He will leave for his new station the latter part of this month.

Lloyd E. Tracy has been elected vice president of Oil Well Supply Company, U. S. Steel subsidiary, and will retain the position of general manager of sales. He joined the company in 1935, going from National Tube Company, with which he had been affiliated since 1927. He became general manager of sales of Oil Well Supply in 1943.

Lloyd E. Tracy

Nelson Sullivan will represent Union Wire Rope Corporation in Texas. Sullivan's headquarters will be at the Union Wire Rope Corporation's branch, 5803 Navigation Boulevard, Houston. **R. O. Tuxson** is the manager of the Houston branch.

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for OIL FINANCING

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1st NATIONAL

First National Bank in Dallas

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Deaths

Alexander Lucius Dade, Jr., 49, Tulsa, vice president of Deep Rock Oil Corporation, died of a heart attack in Kansas City, Mo., December 8. A first lieutenant and pilot in the Air Forces during World War I, Dade moved to Oklahoma shortly after the war, making his home in Oklahoma City, where he was engaged in business with H. M. Byllesby & Company of Chicago. He worked in Illinois for several years, then established residence in Tulsa in 1925. He was affiliated with Shafer Oil & Refining Company prior to joining Deep Rock.

Bert L. Turner, 73, pioneer oil contractor of Houston, died December 11. He was associated with L. Lechenger, Inc., until 1934, and later engaged in the purchase of oil leases and royalties until his retirement in 1945.

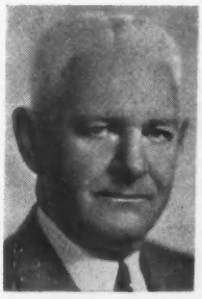
Charles E. Hane, Tulsa, former vice president of the old Tidal Oil Company (now Tide Water Associated Oil Company) died of a cerebral hemorrhage December 6. A resident of Tulsa for 40 years, Hane moved to Tulsa from Bartlesville, Okla. He was secretary-treasurer of Oklahoma Oil Company until 1920, when he was elected vice president and treasurer of Tidal Company.

John J. Connors, 67, Tulsa, retired employe of the Texas Company, died December 4 following a lengthy illness. He was retired by The Texas Company in 1941 after having served 27 years in the production department.

Thomas O'Connor, 64, rancher, banker and owner of the Tom O'Connor oil field in Refugio County, Texas, died December 5 at Victoria, Texas. He was a director and vice president of the Victoria Bank and Trust Company.

E. M. Gretzler

Thomas J. Walne



William H. Taylor

J. D. Connor

Roy Davis

R. C. Buchanan

Four Promotions Are Announced By National Supply Company

The National Supply Company has announced four promotions. Two vice presidents have been named for National Supply Export Corporation: Thomas J. Walne, as vice president and general manager, and E. M. Gretzler, as vice president in charge of export sales.

The promotions became effective upon the retirement of L. V. Boggs, who established the export department that later was incorporated as a subsidiary, and who is now with the company in an advisory capacity after serving 26 years. Walne has been in the oil industry since 1923, serving in Trinidad from 1936 to 1943, when the joined National Supply. Gretzler has been connected with the company since 1919. In 1927-37 he was manager of the branch in the Ploesti oil field, Roumania.

J. D. Connor was made district manager at St. Louis of the Superior Engine Division of National Supply. He has been with the company since 1935 except for a period in the armed forces.

William H. Taylor was made manager of the Spang-Chalfant Division's Philadelphia branch, which has been reorganized from a sub-office in the Morris Building to a complete district office to handle eastern Pennsylvania, Maryland, Delaware, southern New Jersey, the District of Columbia, Virginia, and eastern North Carolina. Taylor has been with the sales department of Central Tube Company since 1930, and joined Spang-Chalfant when the former company was acquired in 1940.

Cameron Names Rocky Mountain, West Texas Representatives

Cameron Iron Works has appointed Roy Davis Manager of sales for the West Texas district and R. C. Buchanan, salesman for the Rocky Mountain district. Davis will move from Houston to Midland, Texas, where he will be assisted by A. A. O'Connor and M. L. Hooks, who will operate from Odessa, Texas, and Hobbs, N. M., respectively. Davis has been employed by Cameron since 1940, and before that was connected with Gulf Oil Corporation. Buchanan's headquarters will be in Casper, Wyo. He has been with the company since 1944, and had previous drilling experience with producing and servicing companies.

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By LESTER C. UREN

Professor of Petroleum Engineering
University of California

Volume I—Oil Field Development. New Third Edition, thoroughly revised and enlarged. During the decade that has elapsed since the publication of the Second Edition, the technology of oilfield parctice has made notable advances, necessitating a broad revision and considerable expansion in the preparation of this, the Third Edition. Wells are being drilled today to far greater depths than were possible in 1934; new and more efficient types of drilling equipment have been developed; new methods of installing and cementing casing in wells have been devised, new techniques of logging, testing and completing wells perfected; the principles governing oil field development practice have become better defined. Engineering has entered into this phase of the producing industry to a greater extent than in any previous decade, with consequent improvement in methods, equipment and efficiency.

Approximately 775 pages, 5¾ x 8¾. Price.....$7.00

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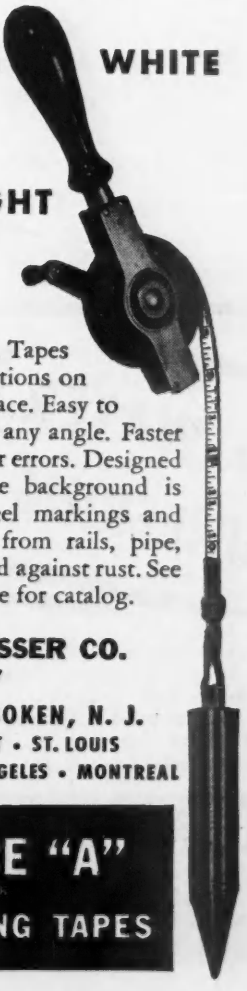

WYTEFACE "A" Steel Tapes have *raised* black graduations on a crack-proof white surface. Easy to read in any light, from any angle. Faster measurements with fewer errors. Designed for hard service. White background is protected by raised steel markings and rims. Resists abrasion from rails, pipe, rocks, concrete. Protected against rust. See your supply house. Write for catalog.

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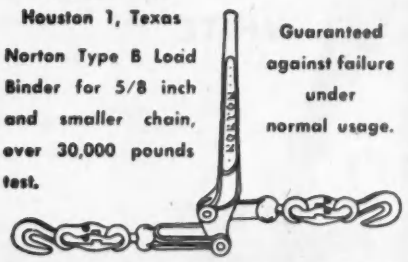

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Abilene, Texas, Store Opened By Republic Supply Company

Republic Supply Company has opened a store at 1641 Pine Street, Abilene, Texas. E. E. Copeland, who has represented Republic in the Fort Worth and Shreveport areas for many years, will be the manager.

With the opening of this store, Republic now serves the oil industry from 50 sales and service points in Arkansas, Illinois, Indiana, Kansas, Louisiana, Mississippi, New Mexico, Oklahoma and Texas. Headquarters are in Houston.

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